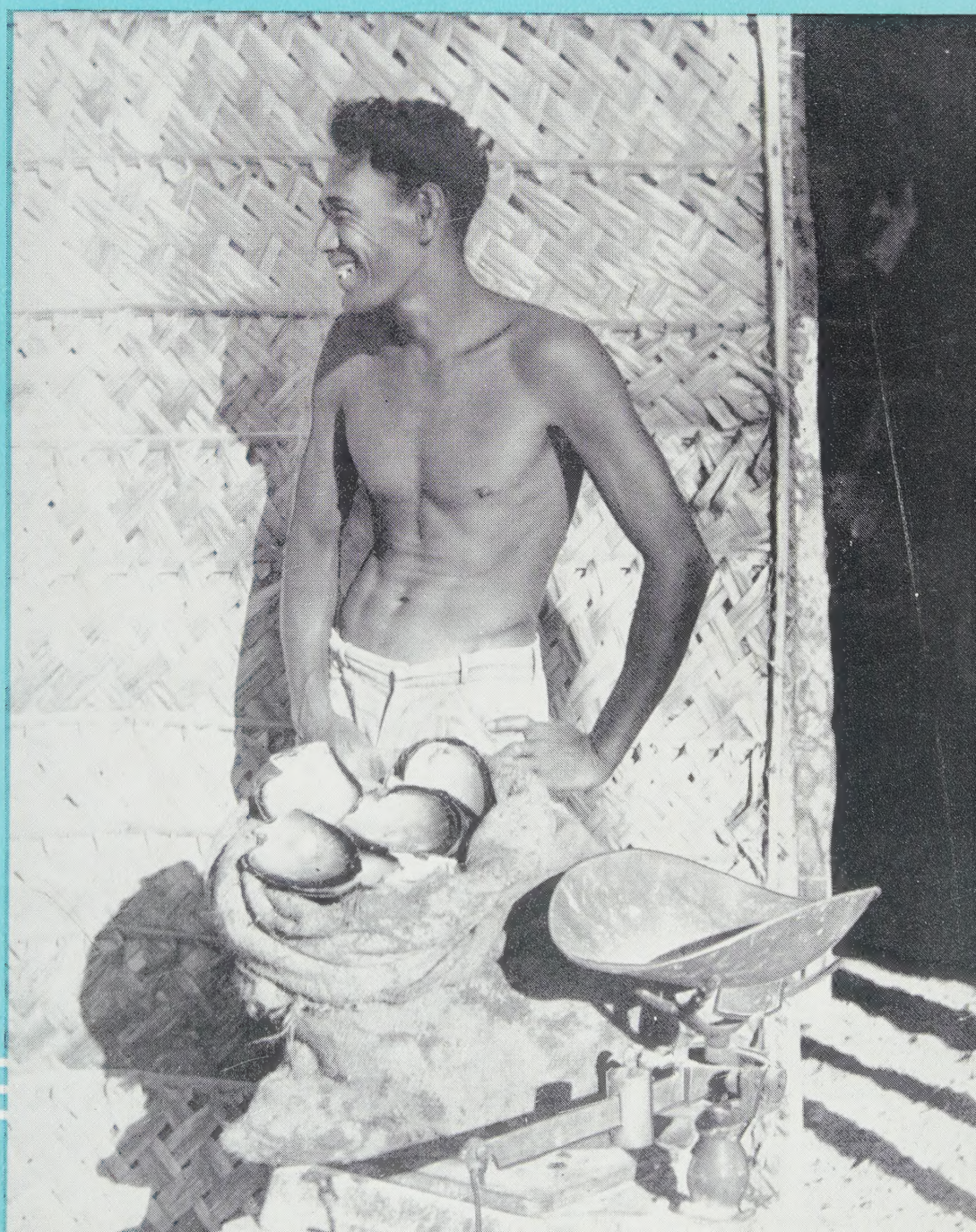
7(3)
PERIODICAL
7(3)

SPC
SOUTH PACIFIC COMMISSION

quarterly Bulletin

SEP 1957
LIBRARY
POFI
FISH & WILDLIFE
SERVICE



2/- STG.

2/6 AUSTRALIAN
● 2/3 FIJIAN ●
30 CENTS UNITED STATES
1 NEW GUINEA GUILDER

JULY, 1957

W. R. CARPENTER & CO. LTD.

HEAD OFFICE: 27 O'CONNELL STREET, SYDNEY, N.S.W.

ESTABLISHED 1914 - - - - - *CAPITAL* £2,500,000

Over 40 years of Pacific Island Development and Service

ASSOCIATE COMPANIES THROUGHOUT THE PACIFIC:

NEW GUINEA:	New Guinea Company Limited	*RABAUL, KOKOPO, LAE, MADANG, KAVIENG*
PAPUA:	Island Products Limited	*PORT MORESBY*
FIJI:	W. R. Carpenter & Co. (Fiji) Limited	*SUVA* and *LAUTOKA*
	Suva Motors Limited	*SUVA* and *LAUTOKA*
LONDON:	W. R. Carpenter & Co. (London) Ltd., 13 Rood Lane	*LONDON*, E.C. 3

SOUTHERN PACIFIC INSURANCE CO. LTD. Head Office, 60 Hunter St., Sydney.
BRANCHES AT: SUVA, RABAUL, MELBOURNE AND NEWCASTLE.

BUYERS AND EXPORTERS OF:

COPRA
COCOA
M.O.P. SHELL
TROCHUS SHELL
GREEN SNAIL SHELL
ETC.

COCONUT OIL MILLS:

ISLAND INDUSTRIES LTD.
SUVA, FIJI

COCONUT PRODUCTS LTD.
TOBOI, RABAUL
NEW GUINEA

MERCHANDISE STOCKS CONSISTING OF:

EVERYTHING REQUIRED
IN THE ISLANDS
AVAILABLE AT
ISLAND CENTRES

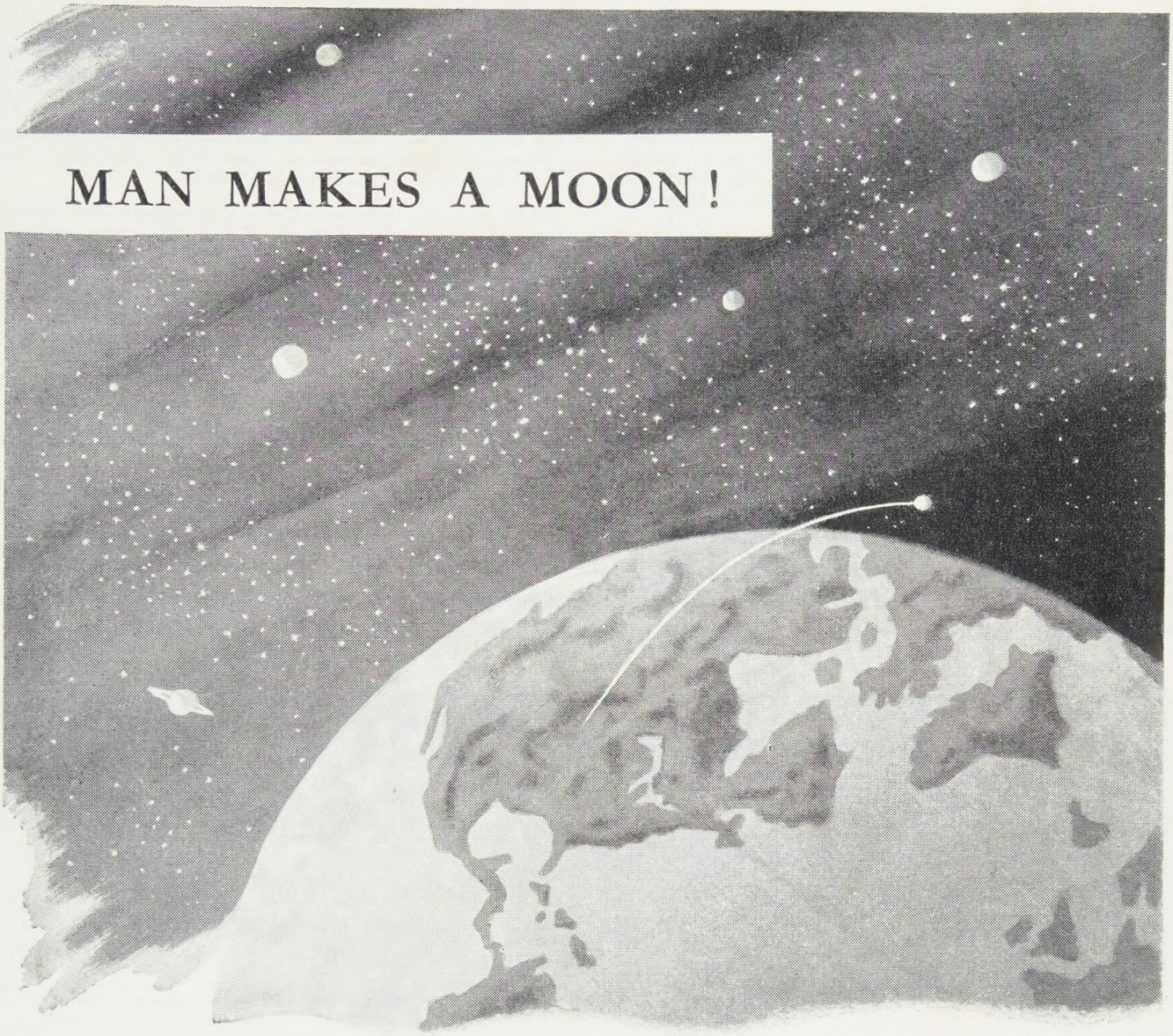
Inter Island Shipping Services to Plantations in New Guinea and Fiji

DISTRIBUTORS THROUGHOUT THE PACIFIC FOR:—

All types Motor Vehicles, Tractors
and General Merchandise

PACIFIC SHIPPING SERVICE FROM AUSTRALIA VIA NEW GUINEA AND FIJI TO PACIFIC COAST OF CANADA AND UNITED STATES

MAN MAKES A MOON!



AN ARTIFICIAL SATELLITE, a midget moon, will be hurled into an orbit 300 miles above Earth late this year, or early in 1958.

It will be an American contribution to the astonishing scientific programme of the International Geophysical Year.

The satellite—a gleaming sphere 20 inches in diameter and weighing 21½ pounds — will be carried to the threshold of space by a three-stage rocket. Its orbital speed will be 18,000 miles-per-hour, and it will circle this planet every 90 minutes.

Instruments inside the satellite will radio back to Earth information about air density, temperature and pressure, the shape of the planet, the intensity of solar and cosmic radiation, and the incidence of meteors.

SHELL UMF, a new aviation fuel, is being used in development of the first-stage rocket that will carry the tiny fact-finding, space-probing ball aloft.

Woomera, South Australia, may become the base for subsequent satellite launchings.

Shell serves Australia . . .
YOU CAN BE SURE OF SHELL

464/C

The South Pacific Commission

The South Pacific Commission is an advisory and consultative body set up in 1947 by the six Governments responsible for the administration of island territories in the South Pacific region (Australia, France, the Netherlands, New Zealand, the United Kingdom and the United States of America).

The Commission's purpose is to advise the participating Governments on ways of improving the well-being of the people of the Pacific island territories. It is concerned with health, economic and social matters. Its headquarters are at Nouméa, New Caledonia.

The Commission consists of not more than twelve Commissioners, two from each Government. It normally holds one Session each year. There are two auxiliary bodies, the Research Council and the South Pacific Conference.

The Research Council meets once a year. Members are appointed by the Commission, and are selected for their special knowledge of the programme of the Commission, and of the problems of the territories in relation to the work of the Commission. The Research Council advises the Commission on its programme and gives special consideration to research matters. The carrying out of approved research is the responsibility of the Secretary-General and other principal officers.

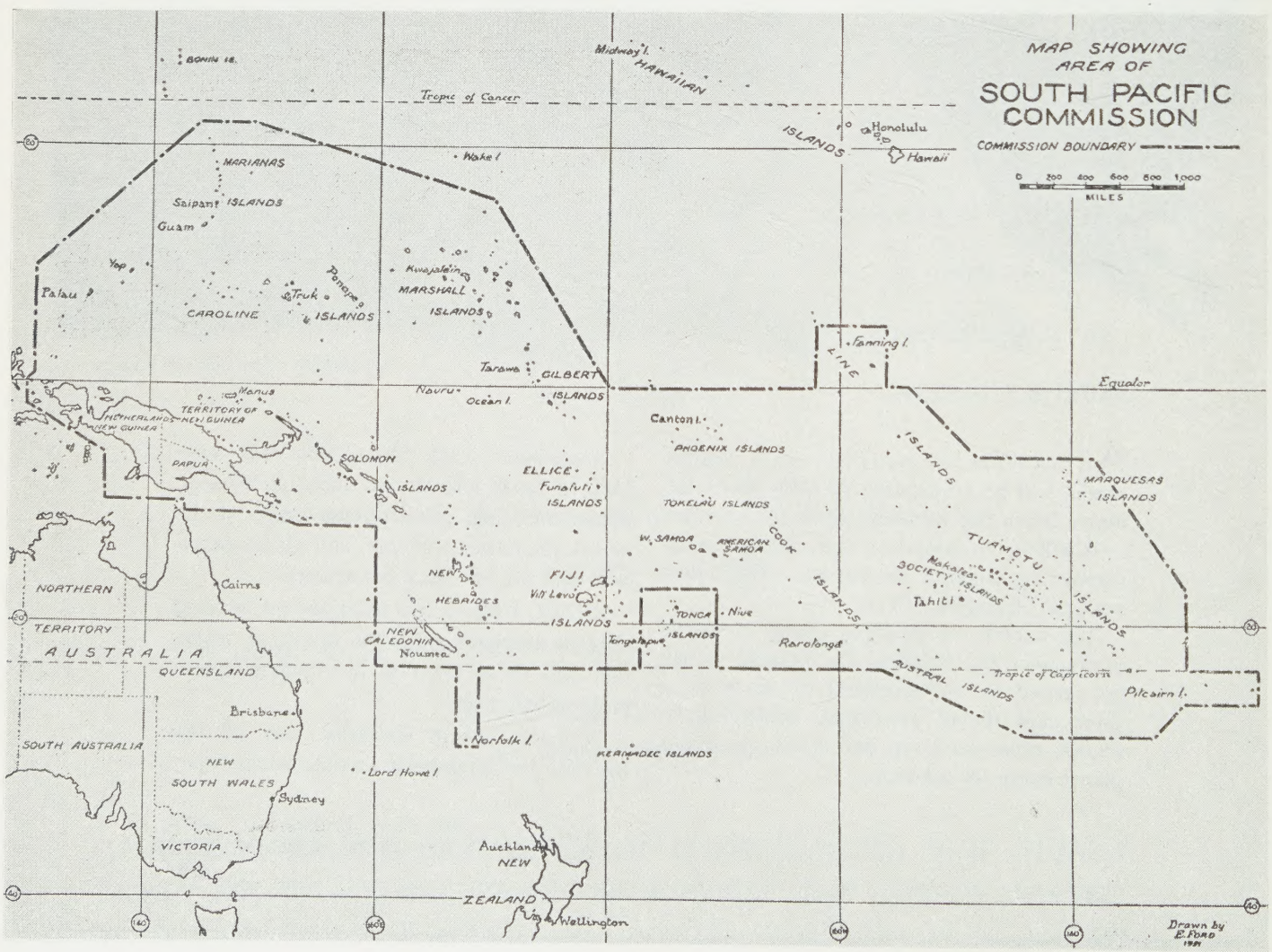
The South Pacific Conference, which meets at intervals not exceeding three years, consists of delegates from the local inhabitants of the territories, who may be accompanied by advisers. The first Conference was held in Fiji in April 1950, and was attended by delegates from fifteen territories and from the Kingdom of Tonga. The second Conference was held at Commission headquarters in April 1953. The third Conference was held in Fiji in April-May 1956.

The principal officers of the Commission are: Secretary-General, Dr. Ralph Clairon Bedell; Executive Officer for Health, Dr. E. Massal; Executive Officer for Economic Development, Dr. A. H. J. Kroon; Executive Officer for Social Development, Dr. Richard Seddon. The powers and functions of the Deputy Chairman, Research Council, are exercised by the Secretary-General.

Further particulars of the Commission's activities may be obtained from the Secretary-General, Nouméa, New Caledonia.

FRONT COVER PHOTOGRAPH

Pleased with his day's work, a Tahitian pearl-shell diver brings the shell he has won to a store, where it is checked and weighed for purchase (see story on page 19).



SPC QUARTERLY BULLETIN

VOL. 7, NO. 3 JULY, 1957

CONTENTS

	Page
SPC Research Council Holds Eighth Meeting	12
Standardized Grading For Pacific Copra An Urgent Need. *By D. R. A. Eden*	14
Mother-of-Pearl Industry In French Oceania. *By Michel Gug*	19
SPC-WHO Health Education Training Course	21
Dental Caries In Nauruan School Children. *By P. B. Cadell*	22
Co-operative Development In The Gilbert And Ellice Islands *By H. R. R. L. Cooper*	24
The Coconut Industry In The South Pacific	27
After The Mass Campaign—Planning The Way Ahead To Health. *By Thos. C. Lonie*	29
Coconut Research Outside The South Pacific (2). *By E. J. E. Lefort*	34
Port Vila School Co-operative. *By Christian Leroy*	37
Shade Problems Of Cocoa In Papua And New Guinea. *By D. R. A. Eden*	39
Breeding Turtles For Profit. *By Ronald Powell*	41
Papua And New Guinea Uses S.I.T.C. For Classifying Imports And Exports	42
The Pacific Islands And The South Pacific Commission	45
Transplanting Trochus In The Eastern Pacific. *By H. van Pel*	47
"Pacific Reading"—Notes And News	49
Book List No. 17	50
Visual Aids	52
Quarterly Reading List No. 21	53
SPC Technical Papers	55
Principal Commission Publications	56

THE SPC QUARTERLY BULLETIN, first published in January, 1951, features articles on selected activities in the Commission's three main fields of operation: economic development, health and social development. Articles are also contributed by specialists working in these and related fields, in the territories within the Commission area.

THE BULLETIN is given selective world distribution to people and institutions in widely differing fields sharing a common interest in the purposes and work of the Commission. It is published in two editions, English and French.

SUBSCRIPTIONS and orders for single copies should be directed to: South Pacific Commission, Box 5254, G.P.O., Sydney, Australia. Subscription rates are given in the Table below.

ALL OTHER ENQUIRIES relating to the SPC QUARTERLY BULLETIN should be directed to: The Editor, South Pacific Commission, Nouméa, New Caledonia.

UNLESS OTHERWISE STATED, all material appearing in the SPC QUARTERLY BULLETIN may be reproduced without prior reference to the Secretary-General, provided that acknowledgment is made to both source and author.

THE ORIGINAL TEXT of all articles is in English unless stated otherwise.

THE COMMISSION does not accept responsibility for statements made in contributed articles.

SPC QUARTERLY BULLETIN: SUBSCRIPTION RATES

PRICE	STG.	AUST.	FIJI	U.S. $	GUILDERS
Single copy	2/–	2/6	2/3	0.30	1.00
One year	8/–	10/–	9/–	1.15	4.00
Three years	20/–	25/–	22/6	2.80	10.00

W. S. TAIT & CO. PTY. LTD.

take pride and pleasure in serving their many clients throughout the Pacific Islands, where they have been trading

SINCE 1890

We are particularly proud and pleased to be the Purchasing Agents to the

SOUTH PACIFIC COMMISSION

Avail yourself of 67 years' experience. Let our expert Buyers take care of your needs, whether for Australian goods or goods from the U.K., Japan, Holland, Germany and other countries, or from our own

W. S. TAIT (HONG KONG) COMPANY

BE

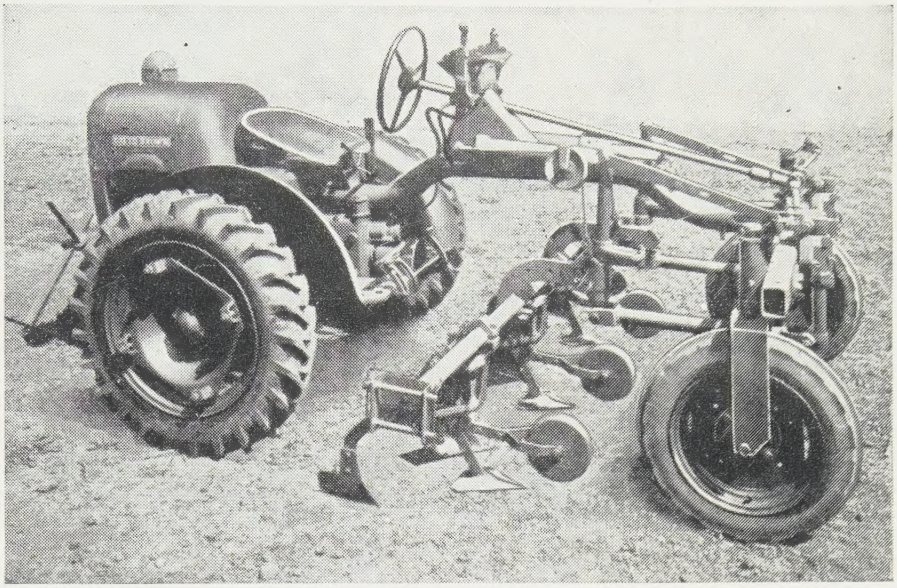
TETE A TETE WITH TAIT'S

OF

8 SPRING STREET, SYDNEY, N.S.W.

CABLES: "SUCCESS", SYDNEY

Quick Facts about the All New



DAVID BROWN

2D DIESEL

- ★ Outstanding functional design, superb quality, unparalleled performance, incorporated in one machine by David Brown.
- ★ Tested and proved from first to last by farmers throughout the world under the toughest working conditions.
- ★ Complete versatility with comprehensive range of simple, low-priced implements reduces man-hours and overall costs.
- ★ 100% working visibility with mid-mounted tools makes possible intricate one-man row-crop work.
- ★ David Brown "Air-Light" lift provides easy implement control.
- ★ Highly manoeuvrable—the 2D and implement can be turned within tractor's own length due to independent foot brakes, 120° lock, and the fact that implements are mid-mounted.
- ★ Quick, easy implement changes with new dowel and single pin linkage system.
- ★ Startling economy and flexibility of new balanced two-cylinder 4-stroke Diesel engine (average fuel consumption of less than $\frac{1}{4}$ gallon an hour in all tests).
- ★ Maximum wheel grip—rear-mounted engine and mid-mounted implements give balanced load and utmost adhesion.
- ★ Quick-starting, air-cooled engine.
- ★ Easy wheel width adjustment from 40" to 68".
- ★ Low maintenance costs ensured by smooth-running engine, simple design and sturdy unit construction.

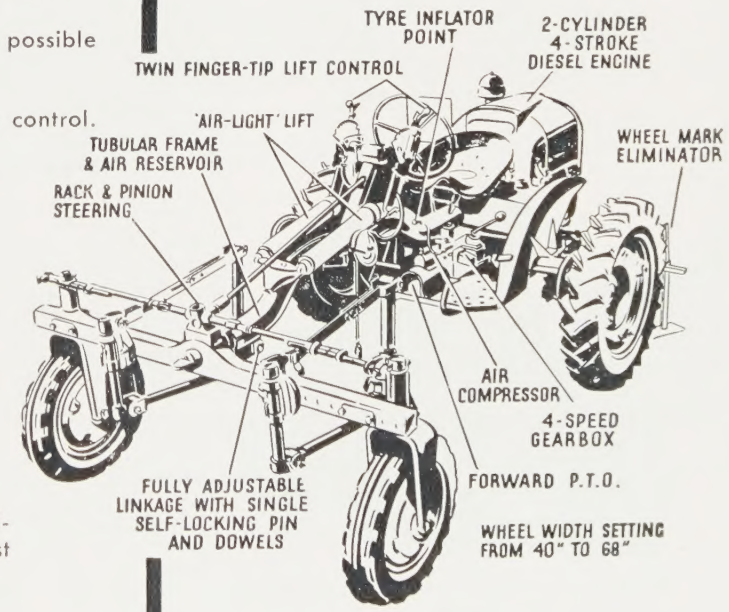
VERSATILITY FOR ALL FARM WORK

PLOUGHING: Unmatched implement control plus dependable Diesel power and correctly balanced weight distribution give sharp, clean furrows!

MOWING: High-speed, great manoeuvrability plus mid-mounted mower, make the 2D the fastest mower on the market!

ROWCROP: 100% working visibility with mid-mounted implements and unsurpassed manoeuvrability make easy work of intricate rowcrop jobs.

HAULING: Plentiful power and easy steering for all haulage jobs—and there's no need to disconnect implements.

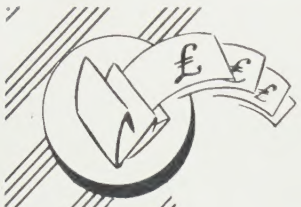


FOR FULL DETAILS CONTACT

N. F. MALONEY & CO.

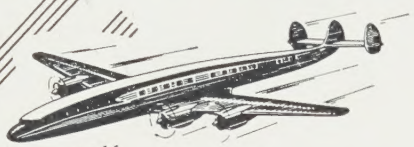
Port Moresby

PAPUA



SAVE MONEY *and fly the Royal Route to Europe via Biak with*

You can double on pleasure and save your money when you travel by Super-Constellation with KLM direct from Biak. It's hard to be precise without knowing your needs, but you can save over £100 on the round trip to London!



Your local Travel Agent will be delighted to tell you about this money-saving proposition, or you can ask KLM for full details.

KLM also provide direct services from Biak to Manila and Tokyo, as well as to Bangkok and all ports en route to Europe.

KLM
ROYAL DUTCH AIRLINES

p.s. You will very much enjoy KLM's famed air hospitality.

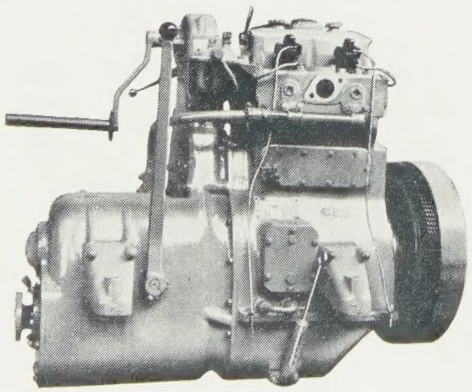
KLM—THE WORLD'S FIRST AIRLINE
KLM
ROYAL DUTCH AIRLINES
58 MARGARET STREET
SYDNEY

Q166

Reliability **THORNYCROFT** *Efficiency*

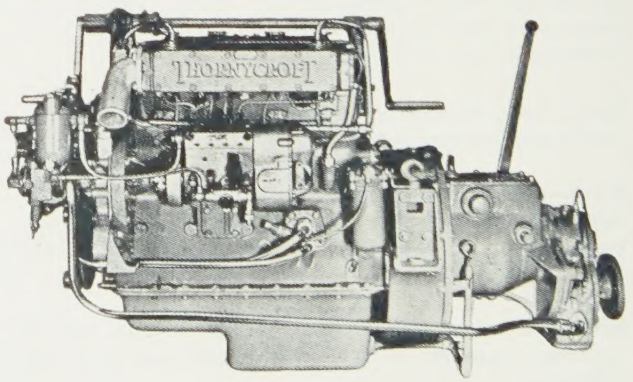
MARINE DIESEL ENGINES

Thornycroft Marine Engines range from 12 HP—16—20—30—50—90 to 125 HP



RJD2. 16 H.P. "HANDYBILLY" DIESEL MARINE ENGINE
General Purpose or Auxiliary

Two of the most popular propulsion units — designed especially for tropical use, combining simplicity of operation with low maintenance cost. Ideal for fishing or general utility service. Your enquiries will receive prompt and courteous attention by staff, who have personal Island experience.



RTR4/D1. 30 H.P. GENERAL PURPOSE MARINE DIESEL ENGINE

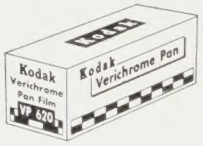
Full information from
THORNYCROFT (Aust.) Pty. Ltd.

Box 2622, G.P.O., Sydney. FF 4224
Cables: "Thornmotor", Sydney

(Photograph by News and Information Bureau, Australian Department of the Interior)

MORE PICTURES ARE BEING MADE . . .

. . . the world over with Kodak Film and cameras than with any other



Always ask for . . .

Kodak Film

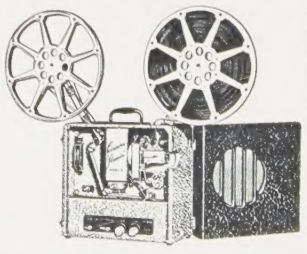
KODAK VERICHROME PAN FILM
with added speed to give you a greater range of better quality snapshots.

KODAK TRI-X FILM
Extremely sensitive — gets the picture in any available light.

KODACHROME COLOUR FILM
the world's best-proved colour film.

Kodak

BETTER SOUND MOVIES AT HOME WITH THE CINEVOX PREMIER



Here is the perfect, lightweight, truly portable 16mm. sound film projector. The Cinevox Premier is newly-designed, smart in appearance, easy to operate, noiseless running. It packs into a handsome case, weighing (complete) only 36 lbs.

Price £193/15/- (exclusive of Sales Tax). Plus Freight and Packing.

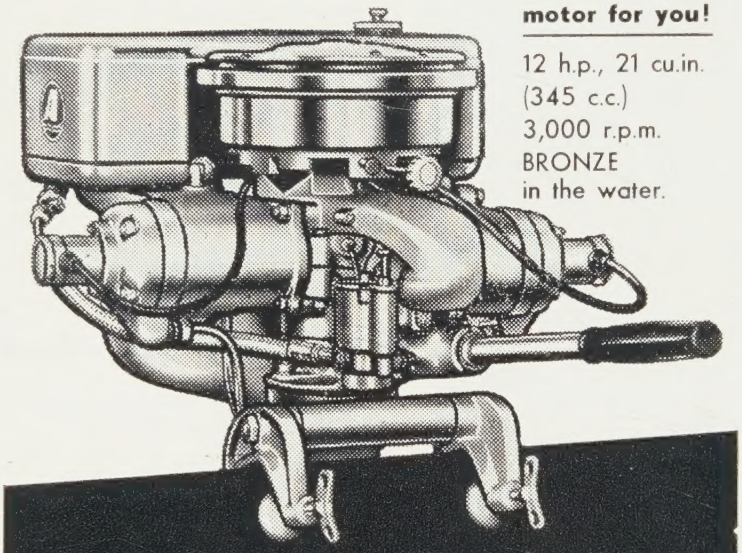
FROM ALL KODAK DEALERS THROUGHOUT THE ISLANDS

KODAK (Australasia) PTY. LTD., SYDNEY

Produce transporter?

B-22 is the motor for you!

12 h.p., 21 cu.in.
(345 c.c.)
3,000 r.p.m.
BRONZE
in the water.



—more money and less work for you with

ARCHIMEDES

The Archimedes is the superior motor for fishing and heavy transport —built on 46 years of experience.

Propulsion Power • Durability • Fuel Economy

. . . have always been typical features of Archimedes motors. The new motors are of generous dimensions with large cylinder capacity, moderate r.p.m. and are sturdily constructed to stand up to the specified performance.

It is worth giving serious consideration to these modern utility motors, which, with their practical refinements, pleasing lines and colours, are a joy to operate.

Sole Agents Australasia and South Pacific Islands

NELSON & ROBERTSON PTY. LTD.

Plantation House, 197 Clarence Street, Sydney

Cables: "Ivan", Sydney. Tel.: BX 2871 (10 lines)

Don't wait...

have it sent

air cargo

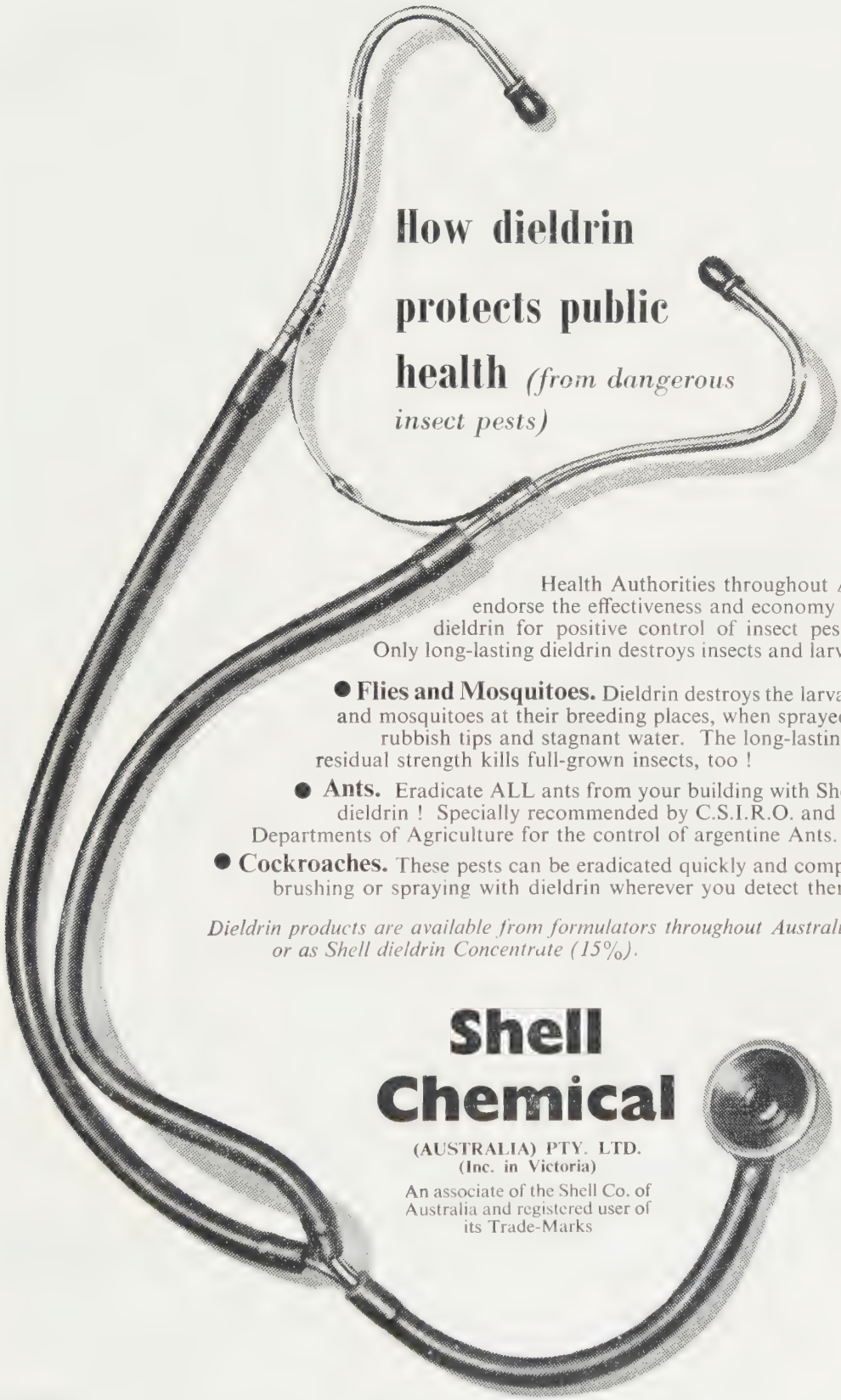
Qantas operates 5 SERVICES WEEKLY FROM NEW GUINEA TO AUSTRALIA. So, when ordering merchandise from Australia, (or from other countries), or when sending merchandise anywhere in the world, arrange to have it forwarded by Qantas Air Cargo for quick, safe delivery. Qantas is experienced in handling all types of commodities from extremely bulky to small and fragile items.

QANTAS

AUSTRALIA'S OVERSEAS AIRLINE

QANTAS EMPIRE AIRWAYS LTD
IN ASSOCIATION WITH B.O.A.C. AND TEAL

PA20 91 4



How dieldrin protects public health *(from dangerous insect pests)*

Health Authorities throughout Australia endorse the effectiveness and economy of Shell dieldrin for positive control of insect pests. Only long-lasting dieldrin destroys insects and larvae too !

- **Flies and Mosquitoes.** Dieldrin destroys the larvae of flies and mosquitoes at their breeding places, when sprayed on rubbish tips and stagnant water. The long-lasting residual strength kills full-grown insects, too !
- **Ants.** Eradicate ALL ants from your building with Shell dieldrin ! Specially recommended by C.S.I.R.O. and State Departments of Agriculture for the control of argentine Ants.
- **Cockroaches.** These pests can be eradicated quickly and completely by brushing or spraying with dieldrin wherever you detect them.

Dieldrin products are available from formulators throughout Australia, or as Shell dieldrin Concentrate (15%).

Shell Chemical

(AUSTRALIA) PTY. LTD.
(Inc. in Victoria)

An associate of the Shell Co. of Australia and registered user of its Trade-Marks

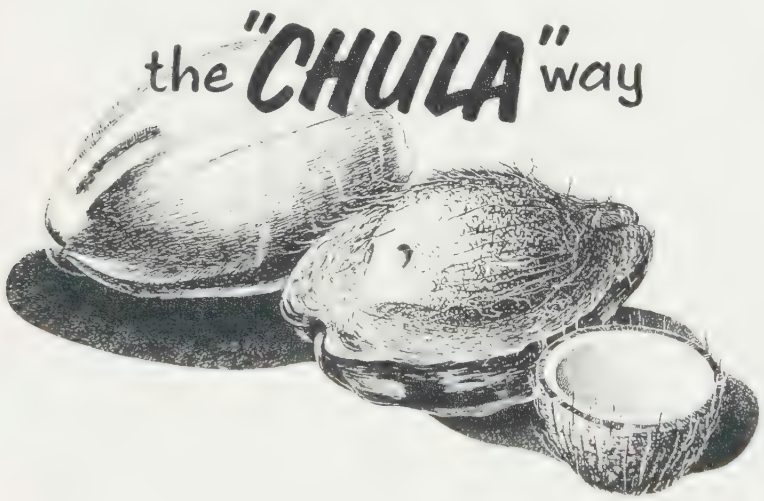
SC 1456 E

"CHULA"

the greatest aid to
better COPRA

NOW manufactured in sizes to suit large or small producers.
Increases production by reducing shrinkage.
Operates in all weathers.
Genuine testimonials can prove our claims.

YOU can produce the highest quality Copra and get better prices by drying



Further details from
TYNESIDE FOUNDRY AND ENGINEERING CO. LTD.
Manufacturers and Sole Patentees
ELSWICK, NEWCASTLE UPON TYNE, ENGLAND.
Cables: "Foundry, Newcastle-on-Tyne". Codes: ABC 5th & 6th Editions.

or from any of these Agents:

PAPUA: The B.N.G. Trading Co. Ltd., Port Moresby.

NEW GUINEA: Burns Philp (New Guinea) Ltd., Rabaul, Lae, Madang and Kavieng.

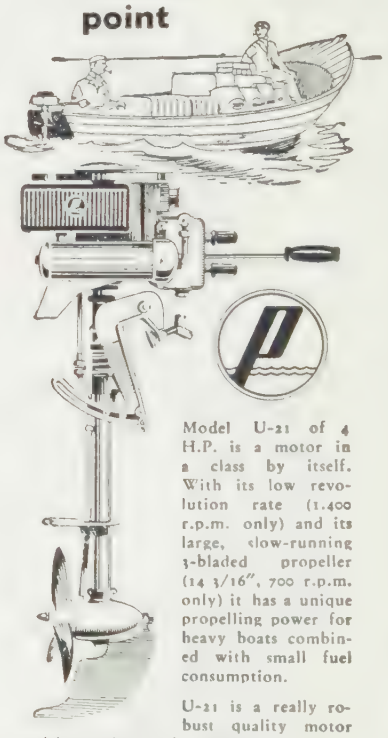
FIJI, SAMOA, TONGA: Morris Hedstrom Ltd., Suva, Fiji.

SOLOMON ISLANDS: K. H. Dalrymple Hay, Esq., Honiara.

IF IT'S
BOATS
OUTBOARD MOTORS
SHIPCHANDLERY
or
MARINE EQUIPMENT
WE HAVE IT

Our 100-page catalogue free if you mention this magazine.

Resistance to wear
— Penta's strong point

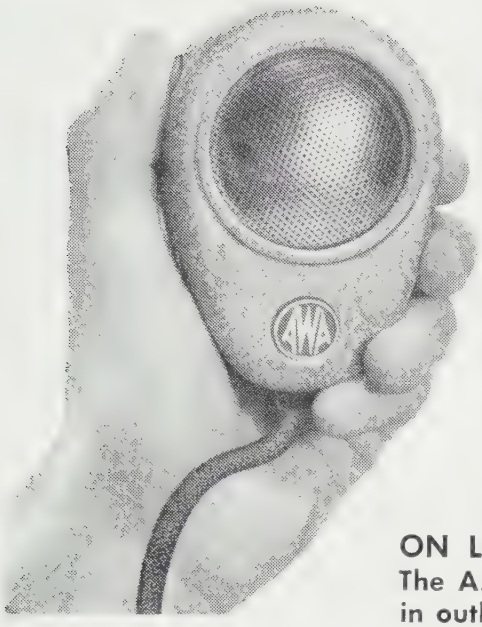


Model U-21 of 4 H.P. is a motor in a class by itself. With its low revolution rate (1.400 r.p.m. only) and its large, slow-running 3-bladed propeller (14 3/16", 700 r.p.m. only) it has a unique propelling power for heavy boats combined with small fuel consumption.

U-21 is a really robust quality motor with i. a. bronze in exposed underwater parts to resist salt water, blows and shocks, and has gained a world wide renown for its reliability and resistance to wear. — Ask for catalogue.

Penta

W. Kopsen & Co.
Pty. Ltd.
376-382 Kent Street, Sydney
Cables: Kopsen Sydney



SIMPLE EFFICIENT SPEECH COMMUNICATION

Teleradio* 5A

RADIO TELEPHONE

ON LAND

The A.W.A. Teleradio 5A breaks down the barrier of isolation in outback areas. In the remote islands of the Pacific, or in the many undeveloped areas of the world, the 5A can be an invaluable help.

AT SEA

Small ships engaged in any trade can benefit by fitting the A.W.A. 5A radiotelephone. There is a widespread network of shore stations available for speech communications. Trained operators are not required.

The Teleradio 5A uses the most modern valves and design features to provide simplicity of operation and efficiency.

Simplicity
Only six controls, no technical skill required.

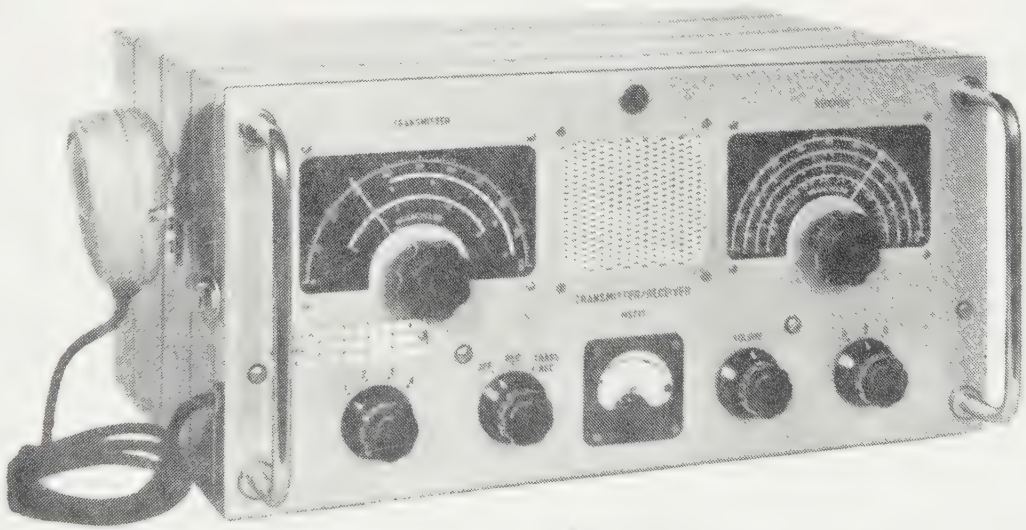
Complete Service
A.W.A. provides a complete equipment ready for connecting to the battery. Full details given on aerials.

Reception
High-performance receiver tunes over a useful portion of the short-wave band, to provide general entertainment.

Battery Power
The 5A works on a 12 Volt battery. Only 3.2 amps. drain when receiving.

Size
In one attractively finished case 9" x 16" x 20".

Further information gladly given



* *Teleradio, regd. trade-mark.*

Manufactured and guaranteed by

AMALGAMATED WIRELESS (AUSTRALASIA) LIMITED

47 YORK STREET, SYDNEY

ES2-56

Members of the Research Council who attended the eighth meeting, photographed outside Commission headquarters in Noumea. Front row (l. to r.): M. F. Cohic, Mr. B. E. V. Parham, Mr. H. J. Coolidge (Chairman), Dr. R. C. Bedell (Secretary-General), Mr. W. C. Groves, Mr. J. C. Cool, Mr. J. M. McEwen, Dr. A. H. J. Kroon. Middle row (l. to r.): M. J. C. Guiart, Med. Lt. Col. G. Boussier, Dr. J. Bierdrager, Mr. B. A. O'Connor, Dr. R. Scragg, Dr. H. B. Turbott, Dr. P. W. Dill-Russell, Dr. H. E. MacDonald. Back row (l. to r.): Mr. R. A. Derrick, Dr. R. Seddon, Dr. E. Massal, Mr. J. Ham, Dr. J. V. de Bruyn, Mr. F. C. Henderson.

SPC Research Council Holds Eighth Meeting

Plans for continuing next year the South Pacific Commission's work to improve living standards of island peoples were finalized by twenty-two Pacific specialists meeting at Commission headquarters in Nouméa during the first twelve days of June.

THE eighth meeting of the Research Council, expert advisory body to the South Pacific Commission, was held at Commission headquarters in Nouméa from June 1-12.

There was a full attendance of the Council, which comprises 22 members. Most are technical officers in island administrations, working in the fields of agriculture, education and health. Four are permanent specialist officers of the Commission.

Chairman for the meeting was Mr. Harold J. Coolidge, Executive Officer of the Pacific Science Board, National Research Council of the United States, with headquarters in Washington.

Observers attended from the Food & Agriculture Organization, World Health Organization, French Institute of Oceania, Australian National University, Pacific Science Board, Bernice P. Bishop Museum, and the Department of Scientific and Industrial Research, New Zealand.

A list of attendances appears on the opposite page.

Main Objectives For 1958

In its deliberations the Council was guided by the recommendation before it, made by the recent South Pacific Review Conference at Canberra, when member governments studied progress achieved by the Commission during its first ten years of operations. This was that the Commission could best continue its work for Pacific islanders by concentrating on a limited number of activities with clearly-defined objectives of practical value to the territories.

Main recommendations that emerged from the meeting relate to nine major subjects. In the economic development field the Council proposes that the Commission should concentrate on rhinoceros beetle control, fisheries development, and plant introduction; in the health field, on health education of the people, infant and maternal nutrition, and mosquito-borne diseases; and in the field of social development, on literature promotion, education, and aided self-help, including co-operatives.

(Continued on page 28)

At the official opening on June 1. Top left: Observers who attended (l. to r.): Mr. C. G. Lennox, Dr. J. M. Cruikshank, Prof. J. W. Davidson, Mr. W. H. Cummings, Mr. W. M. Hamilton, M. M. Legand. Bottom: Members from Netherlands New Guinea enjoying a lighter moment (l. to r.): Dr. J. Bierdrager, Dr. J. V. de Bruyn, Mr. J. Ham.

Chairman for the meeting was Mr. Harold J. Coolidge (left), shown here with the Secretary-General of the South Pacific Commission, Dr. Ralph Clairon Bedell.

EIGHTH RESEARCH COUNCIL MEETING: Participants and Observers

PARTICIPANTS

DR. RALPH CLAIRON BEDELL, *Secretary-General and Deputy Chairman Research Council, South Pacific Commission.*

DR. J. BIERDRAGER, *Director of Health, Hollandia, Netherlands New Guinea.*

MED. LT. COL. G. BOUSSIER, *Head of the Health Department, Tahiti.*

M. F. COHIC, *Acting Director, French Institute of Oceania, Nouméa.*

MR. JOHN COOL, *Director of Local Government and Development Officer, Pago Pago, American Samoa.*

MR. H. J. COOLIDGE, *Executive Director, Pacific Science Board, National Research Council, Washington, U.S.A.*

DR. J. V. DE BRUYN, *Adviser for Native Affairs, Hollandia, Netherlands New Guinea.*

MR. R. A. DERRICK, *Curator of the Fiji Museum, Suva, Fiji.*

DR. P. W. DILL-RUSSELL, *Director of Medical Services, Inspector General South Pacific Health Service, Suva, Fiji.*

MR. W. C. GROVES, *Director of Education, Port Moresby, Territory of Papua and New Guinea.*

M. J. C. GUIART, *Professor of History of Oceanic Religions at the Practical School of Advanced Studies of the Sorbonne, Paris, France.*

MR. J. HAM, *Head, Section Agricultural Extension Service and Education, Hollandia, Netherlands New Guinea.*

MR. F. C. HENDERSON, *Department of Agriculture, Stock and Fisheries, Port Moresby, Territory of Papua & New Guinea.*

DR. A. H. J. KROON, *Executive Officer for Economic Development, South Pacific Commission.*

DR. H. EUGENE MACDONALD, *Director of Public Health, Trust Territory of the Pacific Islands, Agana, Guam.*

MR. J. M. MCEWEN, *Asst. Secretary, Department of Island Territories, Wellington, New Zealand.*

DR. E. MASSAL, *Executive Officer for Health, South Pacific Commission.*

MR. B. A. O'CONNOR, *Senior Entomologist, Department of Agriculture, Suva, Fiji.*

MR. B. E. V. PARHAM, *Director of Agriculture, Apia, Western Samoa.*

DR. R. SCRAGG, *Acting Director of Health, Port Moresby, Territory of Papua & New Guinea.*

DR. R. SEDDON, *Executive Officer for Social Development, South Pacific Commission.*

DR. H. B. TURBOTT, *Deputy Director-General of Health, Health Department, Wellington, New Zealand.*

OBSERVERS

PROFESSOR J. W. DAVIDSON, *Australian National University, Canberra, A.C.T.*

MR. W. M. HAMILTON, *Department of Scientific and Industrial Research, Wellington, New Zealand.*

MR. W. H. CUMMINGS, *Food and Agriculture Organization.*

M. M. LEGAND, *French Institute of Oceania, Nouméa.*

MR. COLIN G. LENNOX, *Pacific Science Board, National Research Council, Washington; Bernice P. Bishop Museum, Honolulu.*

DR. J. M. CRUIKSHANK, *World Health Organization.*

Tahitians cutting copra.

Standardized Grading For Pacific Copra an Urgent Need

The copra industry in the Pacific urgently needs the adoption of a standardized system of grading, with price differentials paid by the buyer and not the exporter, together with separate or well-defined stowage of good and inferior copra, according to the author of this article.

By D. R. A. EDEN*

IN recent years there have been many instances where shipments of copra from the Pacific region have become the subject of buyers' claims and submissions to arbitration for reductions in price on account of inferior quality.

In some of these cases exporters have requested their overseas agents to inform them as to what definition of quality the buyers' claims are based upon. The replies received have not been altogether satisfactory. The issue is usually evaded with a rather vague statement that samples taken from parcels in dispute have not been equal in quality to the standard of copra customarily marketed from the area of origin.

The fact is that there is no written definition of a standard for "South Seas" copra which has been accepted by any body of representatives of both buyers and sellers.

W. V. D. Pieris, writing in the S.P.C. Technical Paper No. 82, Part 2, on "The Manufacture of Copra in the Pacific Islands", states:—

> It has been a common complaint among producers, marketing authorities and exporters in the Pacific and elsewhere that they have not been able to obtain exact information from oil crushers and manufacturers in consuming countries on their requirements as to quality of copra. . . ."

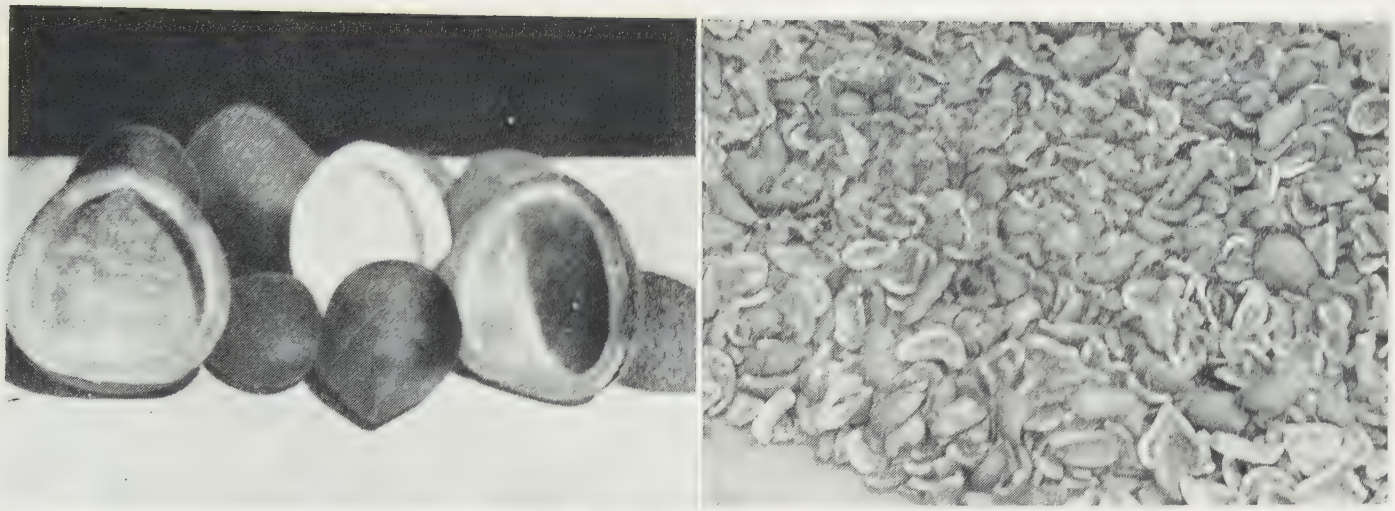
Because the largest percentage of copra produced in most islands in the Pacific is of native origin, where primitive methods of dehydration remain unchanged, it is not so much a question of what the oil crushers' requirements might be as it is one of gaining their acceptance of a well-defined standard for the classification "South Seas" copra which they will pay for as such.

It may even be found necessary to have two or more grades defined. For instance, sun-dried native copra is usually in better demand than the smoke-dried product. The latter variety is often blackened and dirty, and conveys a rubbery taint which manufacturers find hard to eradicate in their products. If oil crushers and manufacturers consider the smoke-dried copra inferior, then its separate classification is surely indicated, and a case for a price differential is established.

It is certainly true that the buying discrimination of manufacturers of oleaginous products has become acute, and, as a result, oil crushers are equally particular as to quality. "Hot-air-dried" already commands a premium of thirty shillings a ton over sun- and smoke-dried copra, and there appears to be reason to suppose that further quality distinctions may be made in the future.

This rise in coconut oil standards has possibly been brought about by larger proportions of world supplies being used in the manufacture of edible fats. More attractive foodstuffs, such as table margarine, as opposed to the old oily butter substitute used in the first World War.

* [illegible]



Ball copra. Perfect copra from whole nuts dried over a slow fire. It is made traditionally in India and Ceylon by placing whole coconuts on racks built over open fireplaces in old-fashioned domestic kitchens. Right: From a New Hebrides plantation. Smoke-dried cut copra, dark brown, dirty, mouldy, oily, scorched, smoke-blackened, unevenly dried, malodorous and deteriorating rapidly.

are being produced by a hydrogenation process. This has strengthened the demand for the best-quality coconut oil, only produced from a high-grade copra with a low free fatty acid content.

It is possible that the use of low-grade copra in the manufacture of common soap is diminishing. The demand for detergents and washing machines may decrease the use of common bar soap in the kitchen and laundry as living standards rise.

Whatever the reason may be, it is certain that copra crushers are reluctant to pay a standard price for a mixed bag of Pacific copra, and the alternative for the near future is a low overall price, or graded copra with price differentials between qualities.

The present method of shipping copra "in bulk" creates difficulties for the segregation of parcels of different origin and quality. This method of emptying the contents of thousands of bags of copra from many sources into the holds of overseas vessels became common practice only during the second World War.

A bulkhead of sacks of kiln-dried copra is erected as a marker between the premium-priced hot-air product and mixed grades of sun- and smoke-dried copra. The latter varieties become blended into one heterogeneous mass in the holds, since price distinctions end at hot-air quality.

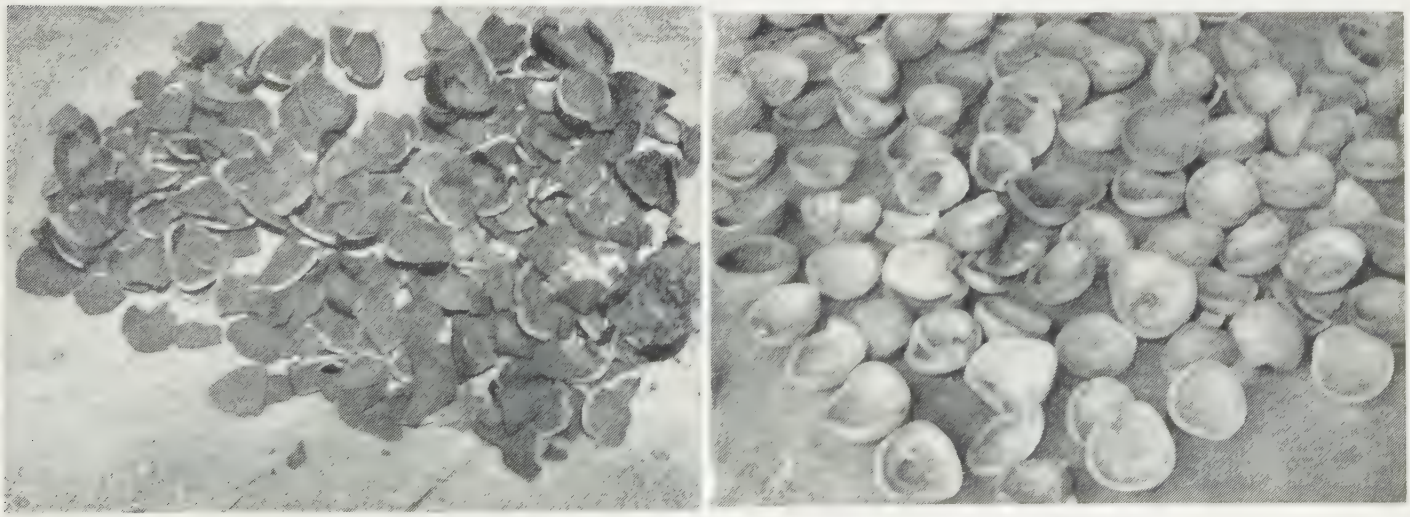
Rubbery taint, blackened pieces, excessive dust and insect infestation from inferior parcels do not tend to improve the overall quality of a hold-full of bulked copra after nearly two months at sea.

This could explain some of the recent claims against the exporters, and at the same time supply the reason why many shippers insist that the copra which they exported had been up to their standard when placed aboard the overseas vessel.

Prior to the 1940's copra was generally shipped in sacks, and, in the case of plantation copra, the brand of the plantation of origin was plainly stencilled on each sack. Most of this class of copra was sold "on mark", and producers carefully protected their brands by maintaining an even quality. Many of the high-quality brands became well known to buyers, and parcels of such marks were eagerly sought.

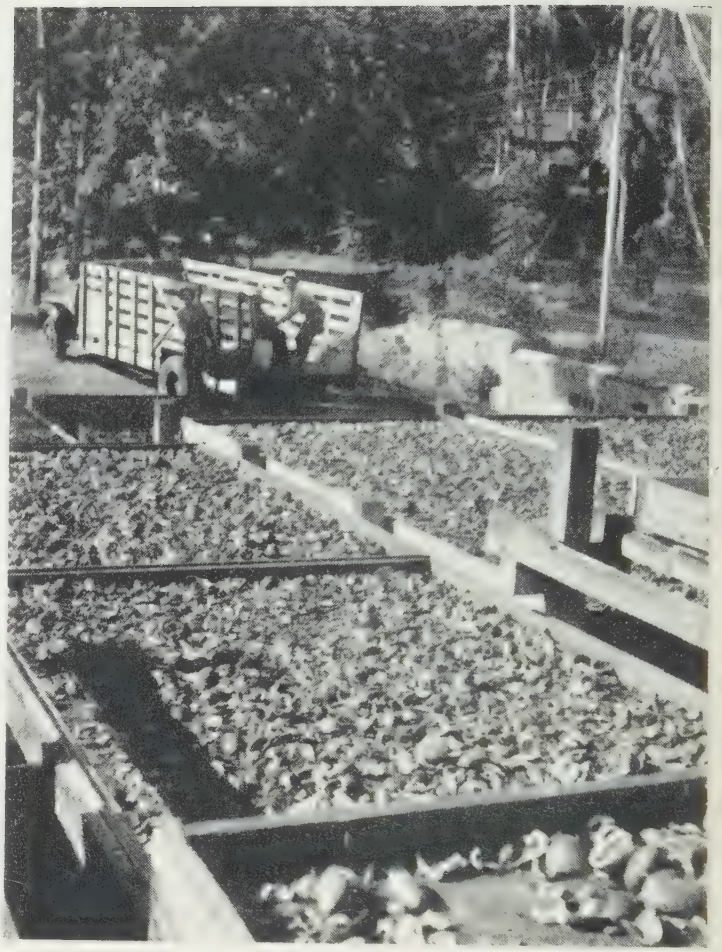
Native copra was also shipped in sacks and branded with the mark of the owner who exported the produce.

Under these conditions there could be no mistake in the matter of ownership, if at any time a parcel were to be judged inferior and a claim lodged. If



Native smoke-dried cut copra from the British Solomon Islands Protectorate under-dried, case-hardened, badly smoke-blackened, mildewed, with a very high proportion of germinated nuts. Right: Plantation copra from half-nuts in shell, made in New Britain in a so-called Ceylon-type drier. It is a mixture of first-quality copra and smoke-blackened, pitted, mildewed and germinated halves.

Sun-drying half-nuts in husk and shell, slung across wires stretched from palm to palm in Lifou Island, Loyalty Group. In fine, windy weather, drying is quick, but copra is liable to infection from moulds.



Sun-drying copra on trays in Tahiti.

Left: Sun-drying on ground on the island of Bora-Bora, Society Group. The half-nuts are tilted and carefully arranged to catch the morning sun. The photograph shows a very good type of large nuts, with thick kernels, drying remarkably well, perfectly white and free from moulds. However, the copra will be spoilt owing to presence of germinated and rotten nuts.

arbitration against the owner was successful, then only the plantation which produced, or the trader or firm who purchased the copra, paid the penalty. Sometimes only a few dozen sacks were affected by the claim. Today one or more holds containing thousands of tons of copra become involved in claims because of bulk stowage.

Nevertheless, the system of bulking has gained popularity on all sides. The buyer pays no package charges and the shipper uses the same sacks over and over again, thereby reducing his bagging costs. The sacks are still roughly branded with the owner's name and are returned as soon as their contents have been emptied into the ship's hold.

The discharging of bulk copra, too, is much faster than the unloading of bagged copra. Special mechanical devices quickly empty the holds and feed loose copra on to waiting trucks on the wharf. The unloading vessel's stay in port of discharge is shortened. This is to the advantage of the buyer who pays freight and handling charges on the copra, and of the ship-owner, who gains a faster turn-round for his vessel.

When all the parties involved in the sale and purchase and transhipment of copra stand to gain through the bulk method of stowage, a reversion to the old method of shipping in sacks seems unlikely.

The copra trade may find it expedient to: –

(a) Call a meeting of representatives of buyers and sellers to formulate a definition of grade or grades of "South Seas" copra.

(b) Agree upon price differentials to be paid if two or more grades are formulated.

(c) Find a satisfactory method for the convenient segregation of various grades in a ship's hold, if shipments in bulk are to be continued.

Pieris has expressed the opinion that: "Oil crushers and manufacturers regard Pacific copra as a highly-variable product in regard to which the formulation of strict standards, related to prices in a fluctuating market, would be futile".

It appears to me, however, that it is the very absence of an accepted definition of what exporters are expected to sell, and oil-crushers expect to buy, that has been partly responsible for the widely divergent and varying qualities of copra shipped from the Pacific Islands. Without such a definition or definitions for native copra to conform to, it is unlikely that an improvement in quality will be effected or any standard maintained regularly.

That such quality definitions are urgently required is manifest from the rash of copra-grading ordinances and regulations which have appeared in many of the island groups over the past few years. The regulations in themselves are admirable, but grade classifications vary between one group and another to almost the same extent as the quality of the copra exported.

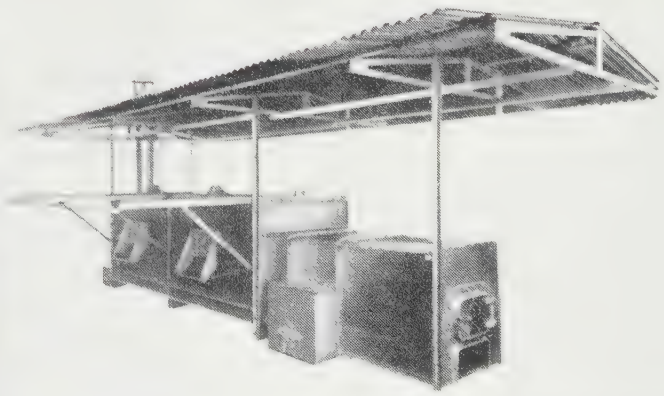
In Papua and New Guinea there are four grades: Hot-Air, Fair Merchantable Sun-Dried, Smoke-Dried, and

Simplest type of open smoke-drier on Efate Island, New Hebrides. It is built of rough timber and sticks tied together with lianes. Copra is dried in shell, half-nuts being placed face downwards on platform, over husk and shell fire. Copra is badly blackened with soot. Structure is also used for sun-drying in good weather, with half-nuts placed face upwards. Right: Miniature native drier in Majura Atoll, Marshall Group, which uses only coconut shell fuel to dry cut kernels. If half-nuts in the shell were dried instead, an excellent copra would result. Dwelling house and copra store on lagoon beach in the background.

Mixed. The British Solomon Island Protectorate has three grades: Hot-Air, Mixed Fair Merchantable and Hot-Air and Fair Merchantable. Tonga decided to have two grades: first and second. Other territories have grading regulations, but do not enforce them, while some have placed full responsibility upon their copra inspectors, and these also have two grades—passed and rejected!

In some groups where grading standards are strictly enforced, inspectors judge the copra and give each parcel submitted its correct grade value. The marketing authority then pays the planter or the trader accordingly. So far, so good, but with the exception of the hot-air-dried, which commands a premium, different grades are finally dumped together in one hold without segregation. The bulk out-turn in these cases is therefore no better than it would have been

	DESIRABLE QUALITIES	*UNDESIRABLE QUALITIES*
COLOUR RANGE	White to steely grey with a pearly lustre	Dull; dirty grey with a white moisture line; charred brown to black and tarry
BREAK	Clean sharp snap	Flaccid; rubbery
ODOUR	Sweet smelling; nutty	Rancid; smoky; mouldy
MOISTURE CONTENT	Up to 6%	Above 6%
FATTY ACID	3 to 4%	Above 4%
CONDITION	Perfectly clean; free of more than 1% of dust; free from sand, husk, shell dirt and black and yellow moulds. (Some green mould is permissible.)	Dirty; containing extraneous matter; containing non-magnetic substances as impurities; having more than 1% of dust; mouldy; infested with insects and their larvae.



Ceylon-type drier in Honiara, British Solomons, built as a demonstration model by the Department of Agriculture. Right: The "Chula" natural-draught bulk drier.

Sample of first-grade hot-air-dried copra.

had no grading regulations been in existence.

One may be forgiven the assumption, therefore, that the grading regulations are enforced, not so much to improve the general quality of the copra exported (though in the long run they would have such an effect), as to protect the exporting organizations against losses which may arise from buyers' submissions to arbitration on quality. In other words, one suspects that the sums saved by "down gradings" of inferior parcels offset the claims paid.

Because only the producer of inferior copra suffers under this system, while the planter or trader selling good produce obtains the benefit of a full price, no one has any reason to complain. A system, however, which must provide against the contingency that its produce may be judged inferior by the time it reaches its destination is ready for overhaul.

Grading, with price differentials paid by the buyers and not by the exporters, and separate or well-defined stowage of the good and the inferior copra, seem to be the obvious alternatives.

The following list of the most important good and bad qualities of copra may not be considered out of place here:

Because the producer of kiln-dried copra may be expected to turn out an almost perfect product conforming with all the desirable features listed above, it is unlikely that the premium paid for this quality will be discontinued in the future. Hot-air-dried copra will continue to be the paramount grade.

It is well known that some islands can produce a very high quality sun-dried copra. Where this conforms with top grade hot-air-dried specifications it should command the same premium.

The "Ceylon" copra drier is a popular type of dehydrator which, when correctly fired and handled, becomes to all intents and purposes a hot-air drier. When improperly used it becomes quite definitely a smoke drier. In the first case it turns out almost perfect copra, and, in the latter case, an inferior smoke-dried product. At its best, its product should unquestionably be eligible for the highest premium.

The next quality is the normal native sun-dried and normal smoke-dried, the "South Seas" copra. The question for the buyers' and sellers' committee would be whether these two products may be fairly classified together. There appears to be more than a little room for doubt that they should be.

Inferior—that is, second grade hot-air-dried copra—could be or should be equal to normal sun-dried.

A third definition could be made for the native smoke-dried, if judged inferior to the normal sun-dried product, and this would, of course, then include the second grade sun-dried copra.

The rest would be generally inferior, and could be dumped together and shipped away in separate holds.

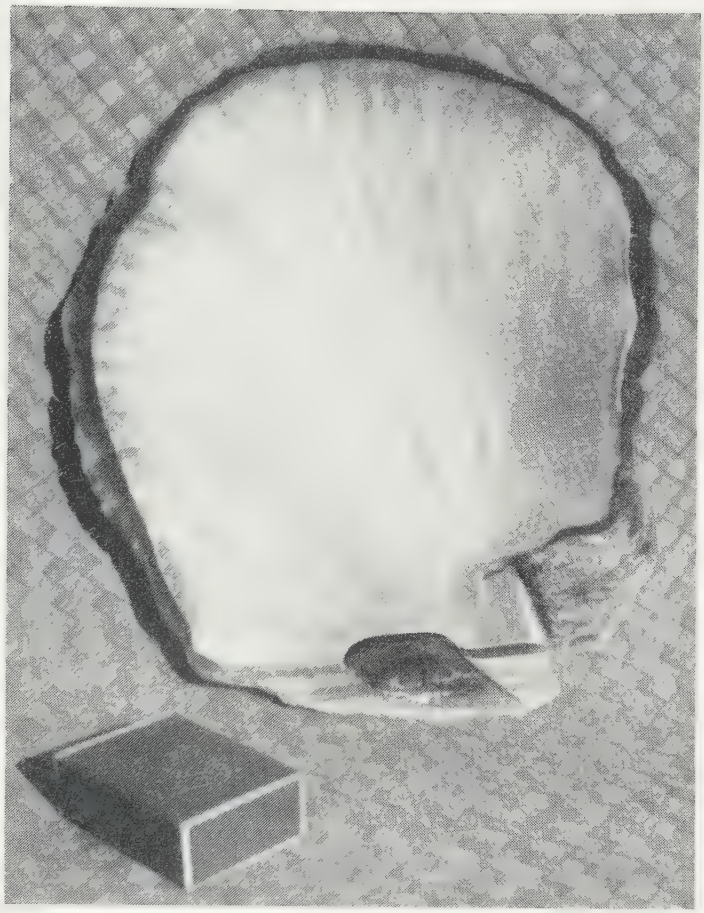
A stabilized price could first be fixed for native sun-dried copra; premiums could be paid for qualities above the standard sun-dried specification, and prices reduced for those below.

A good guide for definitions may be found among the grading regulations already existing in the Pacific and in the Far East.

Samples, agreed upon as typical, could be submitted for scientific analysis to find the limiting proportions of moisture, free fatty acids, dust and impurities

(Continued on page 48)

Sample of good-quality smoke-dried copra.



Above: Opened pearl shell in the bottom of a canoe. Right: Single pearl shell, after removal of the horny outer edge.

Mother-of-Pearl Industry In French Oceania

By MICHEL GUG

Director of Livestock and Animal Industries,
Department of Agriculture, Tahiti.

MOTHER-OF-PEARL is obtained from the two valves of the pearl oyster known by the scientific name of *pinctada margaritifera*. This *pinctada* is the most highly prized for commercial purposes; it is, in fact, the largest in size and the thickest of those found in the Pacific with such colouring.

Average shells measure from 5.5 to 7 inches in diameter, without the horny outer edge, and both valves weigh between 1 lb. and 1 lb. 8 oz. Record weights of 18 and 20 lbs. have been reported in the case of very old shells taken from considerable depths.

Pearl oysters are distributed through many lagoons in French Oceania. Although the largest amounts of mother-of-pearl are extracted from a few rich lagoons in the Tuamotus and Gambiers (Hikueru-Takaroa-Takume - Mangareva-Marutea), quite considerable quantities are supplied from secondary lagoons in these groups and the Leeward Islands. The Windward Islands also possess some. There are apparently fairly dense populations in some of the Austral Islands (Raivavae, for instance). Finally, there is a small deposit of *pinctada* at Nuku-Hiva in the Marquesas, despite the fact that there is no lagoon.

It appears they are to be found at depths of no more than 80 fathoms. They attach themselves to various supports (stones, dead coral, shells, etc.) with a byssus. The mollusc obtains food by filtration of plankton contained in the sea-water. During the breeding season, from October to February, the female and male adults deposit eggs and spermatozoa in the surrounding water, where fertilization takes place. The young embryo thus produced drifts with the current and is drawn down to the depths twenty or so days later. Provided it finds a surface to which it can attach itself, it is assured of survival and may develop to the adult stage. Muddy or sandy depths are unfavourable.

* * *

When a lagoon or part of a lagoon is opened for diving, the divers are required to travel to the spot even from other islands outside the group. They live in temporary villages established near the diving grounds. These communities, which sometimes accommodate as many as a thousand persons, are picturesque places comprising dwelling-houses, stores for purchase of mother-of-pearl, various shops, cinemas and areas reserved for religious observance. For many South Pacific peoples these villages provide the sole opportunity to taste of the delights of a number of modern facilities grouped in one spot;

This village was built solely for the diving period; it will be removed afterwards. Plaited coconut leaves are the main building material. The roofs are made partially of corrugated iron as a means of collecting rain-water, the problem of water supply being of major importance.

hence their attraction for many.

Accompanied by an assistant, the diver travels to the diving place by canoe, frequently using an outboard motor. The canoe is anchored and the diver, wearing watertight goggles firmly covering his eyes, descends into the water with the help of a lead weight attached to the canoe by a rope. The mother-of-pearl shells are removed from the depths with his gloved hand and placed in a net receptacle, likewise attached to the craft. The diver uses one of the ropes for climbing back into the canoe.

The average time spent under water is from 1 minute 30 seconds to 1 minute 45 seconds; the finest divers from Paumotu normally stay under more than 2 minutes at a time. The maximum depth reached is about 130 feet. Beyond this limit and as far as about 146 feet in depth, diving becomes something of a feat, achieved only by a small minority.

Apart from accidents during diving, there is also the risk of an occupational disease known as "Taravana", likely to lead to relapse if the diver persists in his work. The sequellae of this disease are varying degrees of motor paralysis and psychic disturbances. The number of descents made in a day (one diver claims that thirty or so are his daily average, permitting sufficient recovery between dives and avoiding risk of over-tiredness) as well as the precautions taken, not only during working hours, but also in his daily life, play an important part in the occurrence of this disease.

Although it is possible by dint of intensive effort and personal risk for an experienced diver to obtain as much as 120 lbs. of shell, and in exceptional cases even more, an output of 80 lbs. in one day is considered good. During the first month of diving in 1957 at Takaroa and Takapoto, the average quantity of shell obtained per day per head was about 40 lbs. It should also be added that a diver rarely totals more than fifteen days' effective work in one month.

As for pearls, it is a piece of rare good fortune to find one. The sum obtained for it by the diver varies greatly.

Mother-of-pearl shell is used for making trinkets, buttons and various other items. It is particularly appreciated for manufacture of luxury articles. The high quality of the shell obtained in Hikueru, Takume and Takaroa (both in appearance and handling), place South Pacific production in the forefront of the world market. Up to the present no serious competition has been offered by the many synthetic materials now available, and mother-of-pearl has been in particularly high demand of recent years. It is, however, to be feared that prohibitive market rates will encourage some buyers to purchase Australian shell.

Pearl shell occupies an important place among the exports from Tahiti, as shown by the following table:

Year	Tonnage of Shell Exported (*metric tons*)	Value (*Francs CFP**)	Total Value of Exports (*Francs CFP**)
1920	639	3,000,000	24,000,000
1930	321	1,000,000	37,000,000
1946	930	27,000,000	282,000,000
1956	539	72,000,000	658,000,000

* Francs CFP 178 = £stg.1

Rates are usually lucrative for the diver. At the beginning of the 1955 season shell brought 75-80 francs per kilogram at the diving grounds. Prices range from 90-100 francs for the same period in 1957.

Unfortunately, this situation is threatened by de-population of the lagoons, as a consequence of both over-exploitation and the occurrence of

The canoes used are of the standard type, with outriggers. As in these "low" islands there are no trees suitable for hollowing out, the canoes are built from planks. An outboard motor is often used for propulsion.

Pearl-shell divers in French Oceania operate from outrigger canoes. Average time spent under water is from 1 minute 30 seconds to 1 minute 45 seconds. The finest divers from Paumotu normally stay under more than two minutes.

natural phenomena. Measures for conservation include extension of the resting periods for lagoons, the establishment of reserve zones, restriction of the diving seasons, regulations prescribing the minimum size at which shells may be removed[1].

These measures are already effective—many for a long time. However, special arrangements are necessary for certain lagoons, and various technical surveys (oceanographical and biological) are still required.

With this in view, the investment fund for economic and social development of overseas territories has provided financial support for appointment of a biologist, who is to begin work this year.

In conclusion, mother-of-pearl shell has long represented a source of wealth for French Oceania. In the case of Paumotu it is even the sole resource, apart from copra.

Many difficulties and hazards are involved in obtaining it. The pearl oysters found in Oceania possess qualities which are highly appreciated by the manufacturing industries, thus placing them in a most favourable position on the European market. The permanency of markets is dependent not only on the question of prices but also on close observation of strict grading regulations.

Furthermore, much care must be taken in exploiting shell resources, facilitating breeding and multiplication of *pinctada* as far as possible as a means of safe-guarding this heritage, threatened with gradual destruction.

[1] The present regulations on these points are as follows:

—The three-yearly rotation of lagoons or sectors of lagoons is being gradually replaced by four-yearly rotation; in this way, each lagoon or sector will be opened up for diving after three full years' rest, during the fourth year following the previous period of use;

—The diving period is limited to three consecutive months, outside the breeding season, which takes place in March, April and May for lagoons situated north of the 20th degree of latitude;

—No mother-of-pearl shell measuring under 5½ inches (dimension at widest point, after removal of horny outer covering) may be taken. An exception is made at Takapoto and Tearai (Gambiers) where the minimum size is 4 inches.

—The official reserve zones may never be exploited.

SPC/WHO Health Education Training Course

As we go to press, trainees and instructors are gathering in Nouméa for the opening on July 1 of the Health Education Training Course, a joint undertaking by the South Pacific Commission and the World Health Organization. It will last eight weeks.

Taking part in the Course will be some forty trainees now assembling from all parts of the Pacific. Also attending will be an aborigine medical assistant from the Northern Territory of Australia, Mr. Phillip Roberts, and a medical assistant from Uganda, Mr. Sengendo Bagenda, who is studying health education in Manila under a WHO fellowship. The training staff will comprise specialist personnel from the World Health Organization and the South Pacific Commission, assisted by instructors representing different skills coming from various places abroad, including Australia, the Philippines and Guam.

The Course is the second of a series arranged by the Commission for training Pacific islanders in practical ways of helping their own peoples. The first was the Fisheries Training Course held under SPC/FAO auspices from November 19 last to February 21.

While the need for a sound public knowledge of the principles and practice of healthy living is widely recognized, in most Pacific islands the main causes of death and disability actually stem from ignorance, and the South Pacific Commission believes that health education will do much to overcome this tragic lack of knowledge among islanders.

The next (October) QUARTERLY BULLETIN *will carry a full story on the opening and progress of the Health Education Course.*

Dental Caries In Nauruan School Children

A study of the effects of new diets and habits on the dental health of Nauruan school children.

By P. B. CADELL*

A group of Nauruans. The Administration's dental facilities are available free of charge to all island residents.

NAURU is a very small island about twelve miles in circumference, surrounded by reef which is exposed at low tide. There is no lagoon open to the sea. The rainfall is erratic and the soil poor. Food-bearing trees such as coconuts, pandanus and breadfruit are confined to a narrow belt around the coast and an area around a small brackish lagoon inland.

Though the island is small, food habits vary with the districts. People close to the two stores appear to live mainly on rice and tinned meats, while those on the remote side of the island depend more on fish and coconuts.

There is a great variation of diets, from the old native foods to one almost completely dependent on imported foodstuffs. Overall, there is a swing from the locally-available foods such as fish, coconuts, pandanus and breadfruit, towards a more Europeanized, though nutritionally poor, diet from which the better local foods are missing. It is hoped that with more education in diet planning, greater use will be made of local products to augment the diet of imported foods.

Preparation of food varies from native to modern methods. Meals are irregular and unplanned. Cooked foods are nearly always eaten cold. Sugar is used, but mostly in solutions such as cordials. White bread and white rice are readily available from the stores.

Changing social and economic conditions, the poor agricultural potential, and the increased availability of imported foods, have a bearing on the irregular and changing food patterns of this people.

Oral hygiene as once practised by washing the mouth out after meals with fresh or sea water, and the eating of large quantities of roughage such as coconuts and pandanus, has largely been discontinued. Despite the lack of care, the children's mouths are remarkably clean.

The Administration's dental facilities are free to all island residents, there being a fully-equipped surgery, with an Australian dentist, a Nauruan dental mechanic and a Nauruan nurse.

Signs Of Possible Fluorosis

Water supply is by individual tanks for each house, the roof acting as a catchment area. In dry seasons the tanks are filled with water imported from either Australia or New Zealand.

As there is mottling of the enamel in the teeth of some children, an analysis of rainwater samples collected from tanks subject to phosphate dust was carried out. The results varied from no fluorine to 0.2 p.p.m., which is a long way below the level likely to produce mottling of the enamel. As phosphate deposits on Nauru yield approximately 2.8 per cent fluorine in the form of calcium and sodium fluorides, phosphate dust was suspected of affecting the fluoride content of drinking water.

On this limited analysis the fluorine content of the drinking water was for that time insufficient to be considered a major factor towards the comparatively low decay rate. The latter may be attributed somewhat to the intake of raw fresh fish, which has a high fluorine content, along with the low intake of refined carbohydrates. Further work will be done in determining the fluorine content of extracted teeth suspected of being mottled due to high fluorine intake.

The survey was carried out in a manner which was standardized as far as possible. Only native Nauruan children were included in the survey statistics.

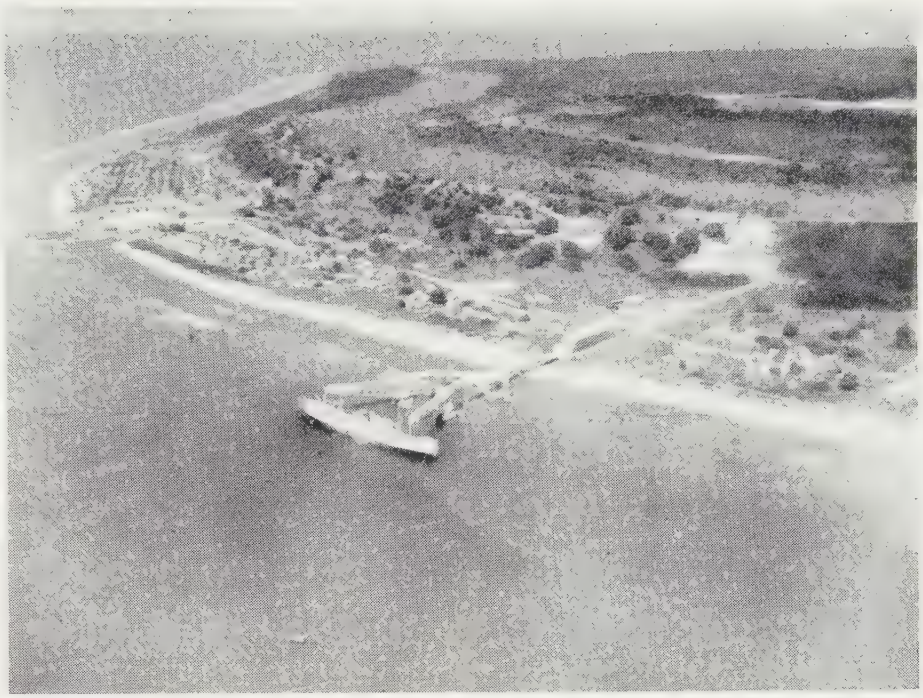
The chief points noticed were that decay between the teeth was comparatively rare, except in the deciduous molars, and these were mostly at the age when about due to be exfoliated. The most frequently involved areas were the chewing surfaces of the six-year-old and twelve-year-old molars. In both deciduous and permanent dentitions, decay of the front teeth was very rare. Malformations of the dental arch were very few and the tissues about the teeth were generally of good tone, but degeneration becomes more marked towards adulthood.

The incidence of decay was recorded by the D.M.F. factor (Decayed, Missing and Filled teeth). The original report in the survey gives figures for separate ages and sexes; those given in the accompanying table are a condensation. There is no remarkable variation of incidence in either districts or sexes.

Education In Dental Hygiene

Preventive measures have been instituted, such as lectures to school children and district meetings. A simple pamphlet has been prepared locally for school children, stressing the natural methods of oral hygiene, and a filmstrip has been obtained for use in the schools. It is hoped to educate the present school

* Dental Officer, Administration of Nauru.



Aerial view of Nauru, a small island about twelve miles in circumference.

children to a degree where most will voluntarily seek continued dental treatment after leaving school, so that dental conditions affecting the adults may become more easily controlled.

A programme of restorative dentistry has been instituted, starting with the nine to eleven-year-old group. Up to the present time over half the total number of school children have been treated.

Remedial action by the addition of sodium fluoride to the many separate water supplies is not possible, as each would require a separate and frequent analysis to determine the amount needed to bring the fluoride content to the optimum level for caries inhibition. The safest and simplest method of fluoridation for this island appears to be that of topical application to the teeth, carried out at the clinic on the appropriate age groups. This programme will not be implemented until more pressing work has been completed on the children. In any case it could well be wasted until education in hygiene is further advanced and has proved effective to some extent.

Tentative Conclusions

The small population of the island (3,500, of which 1,800 are Nauruan), and the generous scale of the dental facilities available, should mean that further deterioration due to neglected decay in school children will be arrested on a scale unique in the Pacific.

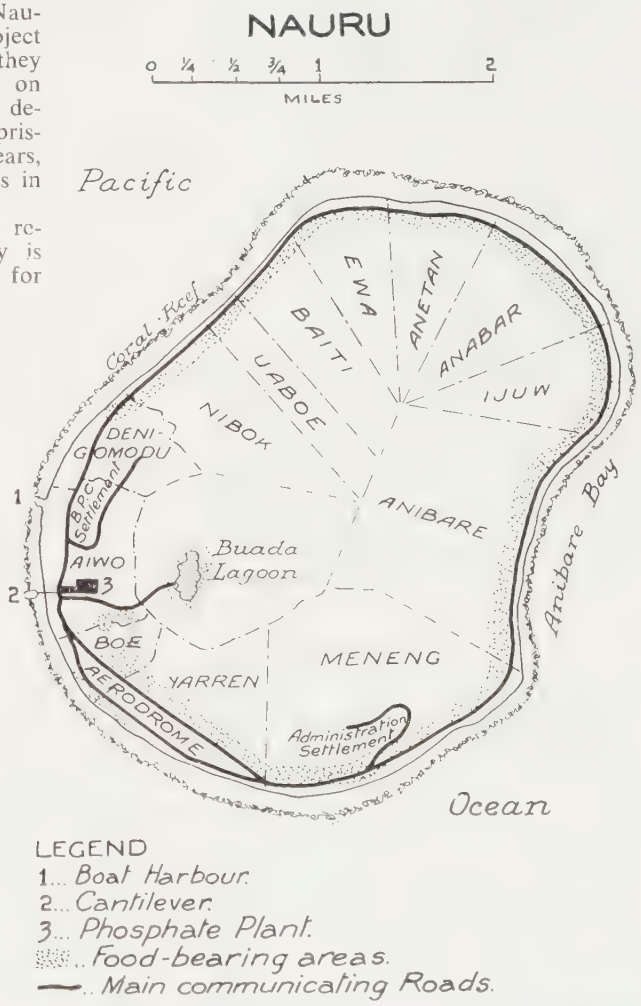
This short resume is intended only to illustrate what may be described as a general trend in the conditions of Nauruan children's teeth as a result of the impact of new diets and habits.

Assuming that the Nauruans' teeth were not subject to dental decay when they were living exclusively on their original native diet, deterioration has been surprisingly slow over recent years, despite the many changes in environment.

To what this apparent resistance to dental decay is due, is still a matter for investigation.

AGE GROUPS	4-5	6-8	9-11	12-14	15-17
Number of Children in Each Sample	76	225	67	67	42
Mean Decayed, Missing and Filled, per 100 Children	175	230	340	290	270
Mortality Index (Mean M+X Teeth per 100 Children)	22.4	52.4	95.5	47.7	28.8
Percentage of Children Free of Caries	51.3	31.5	20.9	24	28.8
Decayed, Missing, and Filled, per 100 Teeth	8.5	8.0	13.9	10.5	9.7

Note.—Mortality Index (M+X teeth) refers to teeth missing, plus those indicated for extraction.



ABOVE LEFT: The "Tungaru", one of the two ocean-going lighters owned by the Colony Wholesale Society and used to service the Co-operative Societies on the outer islands of the Colony. CENTRE: The "Aratoba", an auxiliary ketch owned by the Tangitang Co-operative Union and used to service the six island primary societies of Marakei, Abiang, Maiana, Abemama, Kuria and Aranuka. She carries 25 tons of copra or general cargo. RIGHT: The "Kiakia", the former Colony Government vessel, now owned by the Winimeang Co-operative Union and used to service the islands of Makin and Butaritari and a society on Abemama. She has recently been converted locally to carry some 25 tons of copra.

LEFT: Servicing the island primary societies. General cargo being unloaded into work boats at an outer island. LEFT, BELOW: The cargo comes ashore. The store and office buildings of an island primary society can be seen in the background.

Co-operative Development In The Gilbert And Ellice Islands

According to the author of this brief history of co-operatives in the Gilbert and Ellice Islands, the movement there must be almost unique in that from its first real beginnings in 1938 it has become the sole channel of economic activity in the Group.

By H. R. R. L. COOPER*

THE Co-operative movement first came to the Gilbert and Ellice Islands in 1926 when Mr. D. G. Kennedy, D.S.O., introduced co-operatives to the people of the Ellice Islands. He was followed in the early 1930's by Mr. H. E. Maude, who started a number of small village societies in the Southern Gilberts, notably at Beru, in an effort both to encourage the people to manage their own affairs and to relieve their dependence on the private traders at a time of severe economic depression.

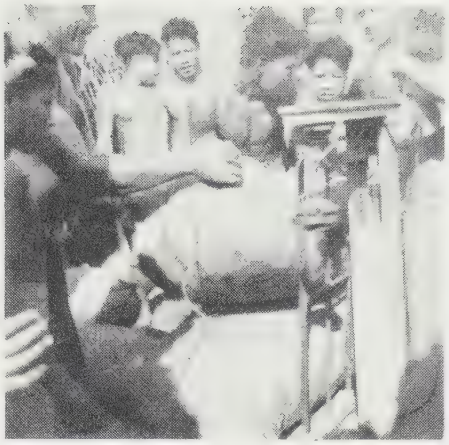
The early societies were short-lived, however, for co-operation among the Gilbertese, in particular, encounters many obstacles in the highly individualistic and independent outlook of the people, together with the very strong family loyalty which almost prohibits, except under great stress of circumstance, the giving of any sort of help or assistance to anyone outside the family group.

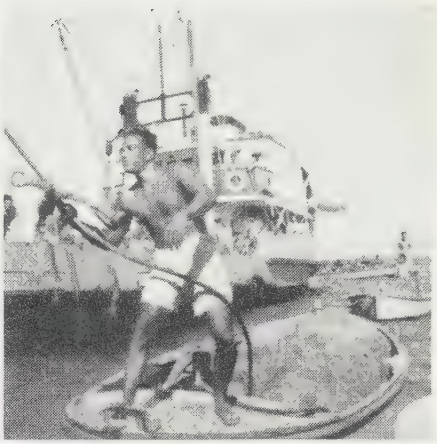
A form of semi-indigenous co-operative did, in fact, emerge in the Gilberts in the years immediately following the Japanese occupation of the Marshall Islands. This was the "mronron"—the Gilbertese word means circle—and which is, in turn, a translation from the Marshallese, where the "mronron" was introduced by the Japanese administration as a form of co-operative organization. (To-day, the Gilbertese "mronron" is a group of people usually all living in one village and often of the same family group, who have joined together for a particular purpose connected with the raising of money.)

The "mronron" members would pool their available cash and copra and buy goods from a local trader in quantity which they would then sell to themselves at a profit and apply the funds so raised to the particular purpose of the "mronron". This might be the building of a church, the purchase of musical instruments for a band or simply the buying of enough food to have a feast.

All these "mronron" were usually short lived, being disbanded when the particular object was achieved or, as was often the case, being broken up when the gentleman who was acting as

* Co-operative Societies Officer, Tarawa.





ABOVE: **Copra in the Co-operative Store, ready for bagging and shipment. The store is of local-style construction and is not suitable for copra storage. These stores are being replaced wherever possible by more suitable buildings.** CENTRE: **Weighing copra ready for shipment to Tarawa, the headquarters of the Colony.** ABOVE RIGHT: **Copra being brought out to the inter-island vessel.** RIGHT: **The headquarters store and office of the Tabiteuea Co-operative Society Limited, Tabiteuea Island.** RIGHT, CENTRE: **The head office of an island primary society.** RIGHT, BOTTOM: **An inspection. An inspector of the Co-operative Department is checking books, while in the background the Assistant Registrar, Mr. K. Nicholson, is talking with the Manager.**

"treasurer" decamped to another island with the funds. If one is to judge by the stories told on the various islands, this was a most frequent occurrence, and it tended to leave many people with a marked distrust of collective enterprise and a strong disinclination to trust their cash to any one other than a close family relative.

"Bubuti" A Problem

A further customary difficulty in the way of co-operative enterprise lay in the custom of "bubuti", similar in nature to the Fijian "kere kere", but apparently more widely applicable. "Bubuti" (the Gilbertese word may be translated as "an irrefusable solicitation") allows one member of a fairly widely extended family group to ask for any possession held by another member of the same group.

To refuse the request brings great shame, and can only be done if the refusal can be excused by reference to the extreme legal penalties that would follow if the request were granted. This did not, however, deter storemen in the early co-operative stores having large quantities of stock solicited from them without payment—with the inevitable financial consequences for the co-operative concerned.

With these obstacles, and the very difficult economic position which beset the colony, as with other copra-producing territories in the years before the war, it is no wonder that the co-operative movement made little headway among the Gilbertese and Ellice people.

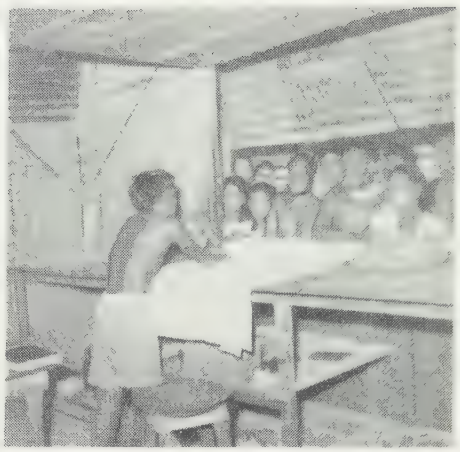
In 1938, however, a real step forward was made with the founding by the people of the island of Abaiang, of the Tangitang Society. "Tangitang" means "cry" or "complaint" in the Gilbertese language, and the Society was founded as a protest against the high prices being charged by the trading companies at Tarawa.

The Society was fortunate in securing the services of Mr. W. P. Schutz, a former employee of Messrs. Burns Philp, as their Manager. Mr. Schutz was not only highly experienced in trading matters, but enjoyed the full confidence of the members of the Society, so that, for the first time, a Co-operative Society managed to impose a very strong discipline upon its members, and succeeded not only in persuading its members not to have any dealings with the trading companies, but in building up a strong corporate loyalty to something which was new, outside the scope of traditional loyalties, and which involved principles which had hitherto been associated in the Gilbertese mind only with the Colony Government and with the European-owned trading companies which operated in the Colony.

The new society rapidly gained strength and spread to the neighbouring islands of Tarawa, Maiana, Marakei and Abemama in the two years immediately preceding the war with Japan. That the Society was strong enough to survive the war spoke well, both for its members and for the quality of its leadership. The Society emerged as the principal active trading concern in the colony after the withdrawal of the Japanese forces in 1944, and was able, after the establishment of the Government Trade Scheme as a means of getting supplies into the colony from overseas, to resume its activities almost without a break.

Tangitang Society Not A True Co-operative

Although the Tangitang Society was indirectly responsible for the enactment of the first co-operative legislation in the



ABOVE: A primary society branch store. CENTRE: Sales over the counter in a branch store. RIGHT: Gilbertese house-wives patronising their village co-operative store.

colony, it could not be said, by any stretch of the imagination, to be a truly co-operative organisation. Its objects were more in the nature of a locally-owned and operated trading company, the shareholders expecting large and fairly rapid profits from the money that they had invested as capital in the society.

The real objects of the society were threefold: to make profits for the members—i.e., the shareholders; to reduce the price of goods by charging smaller profit margins than the private trader; and, lastly, to retain in the hands of the Gilbertese people, the supposedly large profits which the trading companies were making.

To this end the society traded with all and sundry, whether members or not, shared out its profits on the basis of a dividend on share capital and not on a patronage basis, and did its utmost, by the use of such economic and social sanctions as it could apply, to prevent the people of the islands on which it became established, whether members or not, from having any dealings with private traders.

The organization was highly centralized, a head office on the island of Tarawa controlled the branch stores on the neighbouring islands, and the entire control of the operations of the society was vested in the Manager, who also had the right to appoint his successor.

Government Trade Scheme Started

After the Second World War, none of the trading companies which had been established in the colony prior to 1942 saw fit to resume their operations. The Government Trade Scheme was therefore started in order to get supplies of goods to the islands and to lift the islanders' copra; supplies were distributed in various ways, partly through private traders who had been established before the war and had been dependent upon the trading companies for their supplies and partly through hastily set up organizations on the various islands.

To fill the vacuum caused by the non-return of the private trading companies, the Colony Government decided, as a matter of policy, to assist the establishment of Co-operative Societies; a grant for seven years from United Kingdom Colonial Development and Welfare Funds enabled a Co-operative Societies Officer to be appointed, and loans from the United Kingdom and Fiji financed the further operations of the Trade Scheme, which later became the Colony Wholesale Society, now a statutory body with representatives of the Island Co-operatives on the Board of Directors.

It was imperative, if the economic life of the colony was to resume, that some means of buying the islander's copra and selling him the imported commodities that he desired should be established as soon as possible. The economic requirement, therefore, was for a type of organization which both purchased produce and sold goods retail, and, since no other means existed whereby the islander could sell his copra and buy his goods, the organization must deal with all and sundry on the island, irrespective of any question of membership of the organization concerned.

Administratively, since the staff of the Co-operative Department was very small, it was necessary to restrict the number of the organizations formed to one per island. These factors combined to give the consumer-marketing societies which were hastily formed a virtual monopoly of the entire trade of the island on which they were situated.

Many of these hastily-formed societies were modelled on the Tangitang Society already described. Particularly was this so in the Northern and Central Gilbert Islands, where the islands are comparatively large, having up to eight or ten villages, and where Tangitang had extended its influence. In the Southern Gilberts, the same thing happened on a number of the larger islands, except that the committee, consisting of the old men of the various villages, often totally ignorant of the workings of any trading organization, let alone a co-operative, ran the society instead of the Manager, who thus became a cipher in the organization. In the smaller Southern Gilbert Islands and in the Ellice Islands, where there had been no trade stores before the war, the people depending upon the visit of a trading vessel for their trade goods and to sell their copra, a store was a complete novelty.

Liberal credit was allowed to the islanders by the Trade Scheme at Tarawa in an effort to increase copra production, with the result that the new co-operative society appeared to the islanders to be a most wonderful way of obtaining something for nothing. The islanders reasoned that, if after all, the society really belonged to them as they had been told, why should they pay for the things that they obtained from it? Many of the smaller societies were soon in debt with the Trade Scheme on a scale out of all proportion to the size of the island and the possible production of copra.

Membership of the societies was made as wide as possible, in order to attract share capital and to popularize the new society. Nevertheless, it was normal for only one member of the family group actually to hold shares in the new societies.

Some of the societies were started with a very small capital, but, as they had a monopoly on trading within their area of operations, it was expected that they could quickly obtain capital from profits. Other societies had a fairly large initial capital, for with the consistently high price of copra after the conclusion of the Bulk Purchase Agreement with the British Ministry of Food in 1947, there was plenty of ready cash available among the people.

The attitude of the members towards their society varied from the almost

(Continued on page 33)

Coconut plantation near Madang, Australian New Guinea. Cattle grazing on the ground-cover help considerably in keeping down undergrowth.

The Coconut Industry In The South Pacific

A review of Technical Paper No. 92, Economic Aspects of the Copra Industry in the South Pacific, *by E. J. E. Lefort, published recently by the South Pacific Commission.*

THIS survey, which was prepared by Mr. E. J. E. Lefort, Research Officer for Economic Development, South Pacific Commission, was requested by the Research Council meeting in 1955 in order to provide background documentation for the extensive work facing Council members on the vital question of the coconut industry in the Pacific region.

Upon examination, it appeared that Mr. Lefort's survey presented definite value for all those who were closely or indirectly connected with the "tree of life" of the South Pacific, and that it therefore deserved wider circulation. At its fourteenth session the Commission approved this recommendation and decided that Mr. Lefort's report should be published, including not only the comments made upon it, but also the author's replies to these comments. This particular innovation lends this economic survey a decidedly objective character.

Having examined the ecological and human environments of the South Pacific with regard to the coconut, prospects on the world copra market in relation to the numerous factors to which it is subject, the situation of the coconut industry in the South Pacific and, finally, the possible methods of improving the industry in the area, the author arrives at the following conclusions:

1. There is nothing to be seen in the world market situation and prospects for fats and oils generally, and for coconut oil and copra in particular, to give the coconut planter cause for concern, let alone alarm.
2. The greatest handicap to low-cost production in the South Pacific region is believed to be the general low level of productivity, both in European plantations and in native groves.
3. New coconut plantations on new land, using selected planting material and under efficient management, will give a good return on investment and labour.
4. It would be profitable to invest the

Natural stand of coconuts, Tahiti.

required funds in rationalizing production methods in existing plantations and in native groves.

5. It would be profitable to intensify the control of pests and diseases.
6. Plans for organized and stabilized marketing arrangements in the South Pacific region could with advantage be considered.

In the course of his survey the author has stressed the many different factors likely to influence copra production in the South Pacific. On consideration, it would appear that the main obstacles lie actually within production circles. Mr. Lefort does not feel that these obstacles are to be blamed on a lack of goodwill on the part of the territories which devote all necessary attention to copra production, but that they are rather the result of the absence of technical co-ordination of effort on a regional scale. He concludes by stating that the South Pacific despite its disseminated nature, is an economic entity as far as the coconut industry is concerned, requiring, in order to achieve progress, unified and inter-island action.

After the first Coconut Conference, which took place in Manila in 1956, and the F.A.O. Working Party on Coconut and Coconut Products in Colombo in January, 1957, it can be said that Mr. Lefort's survey is highly topical, and that therefore it can hardly fail to attract the attention of all those interested in the South Pacific.

ORIGINAL TEXT: *French.*

SPC Research Council Holds Eighth Meeting

(Continued from page 13)

All these suggested fields of concentration are in fact covered by the Commission's current work programme. The Research Council proposal is that from 1958 to at least 1960 they be given highest priority.

The Council commended the Commission's newest method of working—by arranging regional training courses at its headquarters for islanders. One ten-week course on fisheries was completed last February, while another, on health education, opens on July 1st.

Other topics discussed at the eighth meeting were sub-regional training courses, tourism, and problems of urbanization in the Pacific.

Recommendations that emerged from the eighth meeting of the Research Council will be put before the next session of the Commission due to open at headquarters in Nouméa next October.

Below: Steamer loading bagged copra at a jetty in Netherlands New Guinea. Right: Copra from Western Samoa being lightered to a ship moored off-shore.

Welagi village on the island of Taveuni, Fiji, is typical of some of the Fijian villages whose inhabitants came under the anti-yaws campaign.

AFTER THE MASS CAMPAIGN . . . . .

Planning The Way Ahead To Health

Mass campaigns to "eradicate" certain diseases—notably yaws, malaria, and tuberculosis—are in progress in several Pacific territories, or are contemplated. In order to consolidate the work of mass campaigns, the author of this article stresses the need for following campaigns for improved hygiene.

By THOS. C. LONIE*

THERE have been several stages in the evolution of public health, and healthy living in the world in general. Probably in the tropical world it is easier to mark the transition from one stage to another than it is in temperate zones. This is particularly true when knowledge of disease control and modern methods is of recent introduction and has been succeeded by active and sustained application.

Pests In The Past

There is first the stage when populations are decimated by the major epidemics and pandemics which, spreading generally directly but to some degree indirectly from person to person, community to community, country to country have swept away millions of people, and have only come to an end for reasons not fully understood even now, though frequently ascribed to whatever precautionary measures happened to be in vogue at the particular place at the particular time, ranging from the burning of 'infected' houses to the burning of Jews, heretics, or persons suspected of having the 'evil eye'! In this atmosphere but on surer foundations the idea of quarantine was born—a fundamentally sound idea whose failures have been due to imperfect knowledge of bacteriology, the imperfect observance of the quarantine laws, and in some cases to their impracticable nature.

Notice here that early ideas of quarantine were quite simply keeping persons and things from infected or suspected areas from persons or places which were not infected with the disease in question. The name 'quarantine' refers to the forty days which, in the Middle Ages, was considered to be the period of isolation which would be effective for cholera, typhus and plague, the diseases it aimed to control. Nowadays we use the term quarantine in a much wider and more active way to cover all those measures relating to vaccination requirements, insect and vermin control, etc., which are applied to passengers, animals, goods, and means of conveyance.

All quarantine measures, however, have helped to stem the tide of most of the major pest diseases to some extent, though in some cases like that of the influenza pandemic after the 1914-1918 war it is still not possible to say definitely why an epidemic arose and why it eventually subsided.

Moreover, it must be remembered that for the major epidemic diseases—plague, smallpox, cholera, typhus and yellow fever—there are still uncontrolled foci of infection from which the disease may spread without much warning. In some cases there are grounds for believing that there may be reservoirs of infection in animals. However, the restraint upon these diseases may reasonably be left to those international conventions and arrangements which are designed to control them now. The characteristics of the 'pest' disease is a fairly short incubation period as a rule, an acute illness, a high mortality, and high infectivity.

The Enemy At The Gate

Let us come now to a group of diseases of only moderate infectivity, of a low immediate but a high total mortality, showing evidence of a chronic illness, much invalidity, and having usually a variable and sometimes long incubation period. Examples of such diseases are leprosy, tuberculosis, yaws, malaria, and in the Pacific, filariasis.

The general rate of advance and the immediate effects of these diseases depend to some degree on the length of time during which communities and individuals have been exposed to the infection. Sometimes even when the level of endemic infection is quite high there is developed a kind of equilibrium, both in the individual and the community. But often this is accompanied by a low level of general health. The equilibrium tends to be very unstable, and unfavourable individual or community circumstances—other illness, food shortage, or the disturbances inseparable from war—may cause a serious epidemic flare in the particular disease.

It is this group of diseases which we

* Research Officer for Health, South Pacific Commission.

might call the 'endemic' plagues; they do not come generally in epidemic form, are not self-limiting like those of the previous group, and their suppression requires national rather than international effort, though assistance and supplementation of natural resources is often required to enable a sufficiently massive local control effort to be mounted and to have success.

This is the group of diseases which, in many parts of the world, including the Pacific, are the subject of 'eradication' campaigns.

When, however, all these have been dealt with, where do we go from there? If smallpox, typhus, cholera, plague and yellow fever are kept out of the Pacific, and leprosy, tuberculosis, yaws and malaria are either eradicated or reduced to such a low level that they are of no community significance, have we then solved all our health problems?

The General Advance—And Some Limitations

We have, in fact, only reduced the chance of entry to a country of the first group of diseases by control of persons, animals and goods, and diminished the existing load of infection in the second by treating most of the cases; but we have not necessarily removed circumstances which allow or encourage these diseases to spread when once they have been introduced, and are present even in the smallest degree. Furthermore, these are dangerous diseases like typhoid fever, dysenteries and so on, which cause much morbidity and mortality and *whose causes are usually local.* By 'local' causes, of course, we mean such things as polluted water supplies, defective sanitation, etc., which affect only the people living in the place concerned.

It would be wrong not to emphasize the importance of the general advance in civilization in influencing, usually but not invariably for good, the incidence and spread of infectious diseases. More often than not advances and improvements in habits or manner of life along particular lines have taken place completely without reference to their possible effects on health, and the favourable influence in this regard has been an uncovenanted benefit. In most cases, indeed, the knowledge of the processes of spread of disease was so defective that it would not have been possible to predict the effect on health of improvement in general living conditions. Sometimes, however, commercial and agricultural advance in the absence of knowledge of the means of spread of disease has had an opposite effect, and has led to the rapid extension of a disease previously present at a low level of incidence and morbidity.

The opening up of large areas of jungle land in Malaya for rubber plantations thirty to forty years ago was only too often the signal for a marked increase in the incidence and perhaps the severity of malaria. The causes were two: large numbers of labourers, some of them malaria carriers, were imported to work the new estates, and while their housing and facilities were no doubt better than many had been used to, they were living together in large settlements and the danger of spread of disease was high. They were, moreover, often new to the country and to its diseases. But the major cause was that the cutting down of jungle let the air and sunlight into the many streams and springs of fresh water which abounded in the area, and these provided ideal breeding places for the *Anopheles maculatus* mosquito, the principal carrier of malaria present. It was only when this latter factor was realised that the malaria problem could be controlled in such areas.

However, by and large, improvement in the manner of life and the physical environment have diminished the weight and spread of the epidemic diseases probably more than specific preventive measures, and probably much more than the treatment of the sick. There is no space here to demonstrate the truth of this argument at any length, but any intelligent and unbiased consideration of the facts in relation to the fall in prevalence of the great epidemic diseases will furnish evidence that the treatment and cure of sick persons did not, does not, and by the very nature of infection, could not be expected to control the spread of these diseases in the community.

It is, for instance, almost certainly due to the drainage and subsequent close cultivation of the extensive swampy lands of parts of south-east England that indigenous malaria has disappeared from that part of the world, and the draining and cultivation of the Roman Campagna has eliminated that once very malarious area as a suitable place in which to study the transmission of the disease.

Equally, change in methods of housing construction, improvement in refuse disposal and drainage have reduced the rat population, and the general rise in the standard of cleanliness of persons and their environments has reduced personal infestation with fleas, and this appears to be the reason, rather than any *specific* anti-rat or anti-plague measures for the final disappearance of plague in epidemic form in Western Europe. Yet at one time, as the Black Death, its dramatic epidemics decimated populations, disrupted commerce and sent hordes of people in flight from the places of heavy prevalence, usually the older cities and towns of the mediaeval world. As a side effect, the Renaissance of Learning has been ascribed to the fact that scholars fleeing from the plague carried to new and unaccustomed places the knowledge and culture of which they were guardians.

All these things took place before there was any exact knowledge of bacteriology and the spread of disease. The effect of general improvement in environment was not immediately apparent, but, when it came, it was as permanent as the improvements which accompanied it. But let us note that any reversion to primitive living, as in war, is liable to lead to a return of primitive disease conditions as well.

This improvement in the conditions of living, gradual advancement in the adoption of sanitary habits by the population at large, both as communities and individuals, and the slow permeation of general knowledge of hygiene has probably had at least as much to do with the general fall in infantile mortality as the application of specific knowledge of child care in European communities. The infantile mortality rate is still a good index of the general sanitary status of a community.

Consolidating The Gains

What, however, is the significance of these things to the peoples of the South Pacific? If world conditions and world preventive procedures are such as to protect these somewhat remote territories from the likelihood of plague, cholera, typhus, smallpox and yellow fever, and if mass campaigns reduce to a very low figure the incidence and reservoirs of infection of yaws, tuberculosis, malaria, filariasis, or typhoid fever, will it then be possible to relax efforts of communities and governments towards raising the general hygienic conditions of living?

Let us look at the group of diseases now present in the South Pacific, and to the suppression of which more or less strenuous 'drives' are being made. Let us see whether these campaigns are, in fact, a final solution to the problem.

Consider Yaws first. Yaws eradication campaigns are in process in many areas. As campaigns they are generally very successful, and worth the considerable cost and effort involved in carrying them through. So far as 'eradication' is concerned, however, the conditions are never exactly fulfilled except possibly for very small groups. That is to say, a full 100% of the population is never dealt with, and there is therefore always a residuum from which a cured population can be reinfected.

For instance, the territory of Haiti was in recent years the focus of a yaws eradication campaign. The W.H.O. treponematoses consultant in an article in the W.H.O. Chronicle, Vol. 10, No. 2 (Feb. 1956), states that sample surveys approximately two years after treatment 'have shown that the prevalence of yaws has been reduced to 50 per 10,000 of the population for all cases of yaws and 15 per 10,000 for "infectious cases" '. Referring to a portion of Easter Nigeria, he states that "where, before treatment, the prevalence of active yaws was 1,380 per 10,000 of the population (infectious cases 300 per 10,000) the rate had decreased to 0.30 per 10,000 of infectious cases after treatment". This is *not*

As a preliminary to a campaign against malaria carried out in Dojo-Rama, in Netherlands New Guinea, data were collected on length and weight of children, and blood samples were taken. Right: As an important part of the campaign, mosquito control by residual insecticide spraying was carried out.

"eradication", for there are still a few cases left. It is, of course, a very great improvement, and reduces an otherwise unmanageable problem to a level where it can be handled.

International agencies ultimately must leave the hard core of untreated population and cases to the local health authorities. In theory, the medical services of the latter concentrate on this hard core to secure treatment, but, in fact, the group which resists the enthusiasm and the high power inducements of the mass campaign are likely to remain resistant to local effort. Furthermore, there is very usually a slackening off of effort when 'the tumult and the shouting' of the mass campaign has died away.

Indeed, the World Health Organization recognizes this. It is a condition of their assistance that governments undertake to provide continuing effort to ensure that the advances made in a mass campaign are not lost.

In any event, it is unsafe to rely for a permanent solution on the mass campaign unsupported by a drive against the chain by which infection passes from the sick to the healthy.

In the case of yaws, the agencies which transmit infection are principally the direct contact of the open sore with the abraded skin of the uninfected person, and indirect mechanical transmission of infection from yaws sore to uninfected person on the body parts of the fly.

Clearly cleanliness, protection of the skin from injury, and treatment of sores, especially their protection from infection and from flies, together with measures to reduce fly breeding are required —in other words, general hygiene. Without flies to carry the infection and without access of flies to sores, yaws or otherwise, the chances of the odd infectious yaws case giving rise to others will be much reduced.

Of one Pacific Island Territory, Dr. S. M. Lambert says in his book, *A Doctor In Paradise*: "By 1926 . . . yaws was practically eliminated. This was following an 'eradication' campaign. But in 1956 a new eradication campaign was necessary and in progress in that same territory. The job had not been quite completed the first time. It had not been entirely neglected in the years between, but political unrest, and probably a waning in the enthusiasm for preventive medicine, and ill-conceived 'economy' had let the disease creep back. It is well to be warned."

In the case of TUBERCULOSIS, modern treatment and even B.C.G. vaccination cannot substitute for hygienic measures directed to the avoidance of danger from infective sputum, and overcrowding which concentrates the potential source of infection and the potential victims thereof. *Here* is the danger of the home treatment of tuberculosis where there is the slightest possibility of the case being infectious. It is, in fact, only when there is the greatest care taken that home isolation is in any way permissible. The early workers in tuberculosis who realised this were much more alive to the need for preventive measures than many present clinicians.

It is equally quite clear that the handling of FILARIASIS as a community disease is not simply a matter of treatment by hetrazan and similar drugs, but, in a large degree, the major improvement of the practices of house and village hygiene, so that the mosquito vectors of the disease are not permitted to breed or shelter in or near these places.

The same argument applies in the case of MALARIA, and is the more important because of the problem of resistance to insecticides. In other words, we must not rely solely on killing mosquitoes. We must prevent them breeding and keep them away.

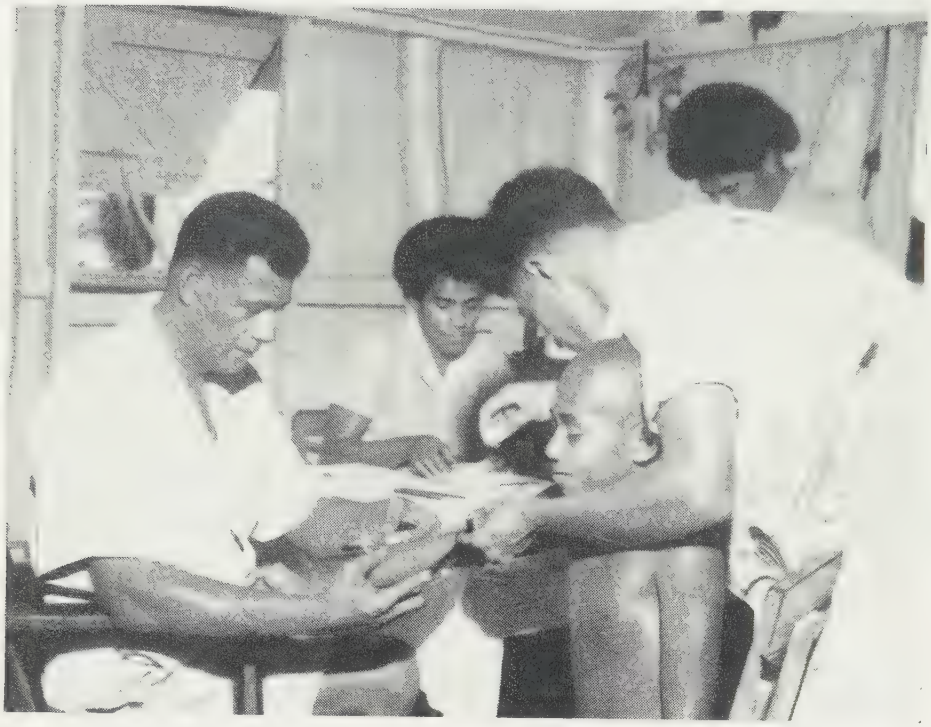
The mass campaign, therefore, whether it is a treatment campaign or a vector eradication campaign, is never the complete and final solution to disease problems. There is always a residuum of infection. What the mass campaign can do, with often striking success, is to reduce the reservoir of infection to such a low level that adequate medical and sanitary organization can prevent it again reaching large proportions. But any disruption or neglect of such services can very quickly undo the work of years. Such disruption is always produced by war. It may also be produced by economic crises resulting in dangerous cutting down of medical services.

The point to be made is that a general rise in hygienic living must accompany the mass campaign, and must persist beyond it if the gains of the campaign are to be maintained.

Bastions Of Defence

In all established communities the provision of adequate water supplies, sewerage, sanitary refuse disposal, the safe handling of food, and adequate housing are the foundations upon which healthy living becomes possible.

Adequate WATER SUPPLIES imply purity and sufficiency. Given such a supply, and, in effect, for a community of any size this necessitates ultimately a good piped supply, the chances of gastro-enteritis, dysentery and diarrhoea, and the typhoid fevers are greatly reduced. Adequacy of supply also provide for cleanliness of persons, of clothing, of houses, of streets, etc. This in turn diminishes the likelihood of the spread



Assistant medical practitioner Malakai Ravai taking a blood sample from a student of the Bucolevu Boarding School on Taveuni, Fiji, during a recent anti-yaws campaign.

of disease, especially diseases in the group mentioned above, by soiled garments and articles, and renders the chances of verminous and parasitic infection of body, clothing, and premises much less.

But without a communal supply much may still be done in improving and protecting very small, even individual household supplies.

SEWAGE AND NIGHT SOIL DISPOSAL has been the subject of concern since the earliest ages and since man first began to live as a member of a community. But in small primitive communities it was not usually much of a problem. The scarcity of water or the difficulty of transporting it meant that there was not much water used around houses. Only for cooking would it be used there as a rule. Otherwise bathing and washing were carried out near or in the water source, and this was often a river which carried away the soiled products. In an inland or seaside village the bush or the seashore received the human excreta. In the latter event they would usually be deposited below high-water mark and washed away by the tide.

The disposal of refuse was subject to like practices. Normally it would be simply thrown into any convenient spot or indiscriminately broadcast. Usually, too, there would be little of it, and that mostly of vegetable, or occasionally animal, origin. In all these circumstances, so long as a house was isolated, and there was plenty of bush or shore, no great harm was done. It is when there are many people that nuisance arises to a degree which may menace the health of the community. This is the position in many parts of the Pacific.

It is necessary to realise that the public sanitary conditions of practically the entire Pacific area, with the exception of a very few towns, are entirely primitive. That is to say, they are without adequate water supply, they are generally without drainage, their arrangements for the disposal of night soil are of the most primitive, and they are without refuse disposal arrangements of any consequence.

The work done in these areas by public-spirited persons, official or otherwise, can, at the very best, meet with only little success in the absence of communal facilities and communal control. Improvement in health has taken place because there has been, in most cases, individual teaching in health care, especially to mothers, but also in schools and to village peoples. Also because islands are isolated from each other, and often villages and houses are also isolated, outbreaks of disease do not tend to spread far under present conditions.

Changing Conditions And Changing Risks

But conditions are changing rapidly. The island people are growing in numbers, they are becoming overcrowded in their houses and in their villages, and there is much movement of population from village to town, and in the reverse direction, too. So the chances of spread of infection are increasing, especially in the case of diseases like tuberculosis. Communities are demanding and receiving WATER SUPPLIES, but those who arrange these too often pay insufficient attention to the amount of water per head available or required, to the arrangements for distribution and treatment and to the protection of gathering grounds. The infective typhoid carrier, dangerous everywhere, who pollutes the gathering grounds or supply in such cases is probably a much greater menace than would be the case where the quantity of the supply was much larger, pollution would be accordingly diluted, and where the water is effectively treated in any case. He would also find it much more difficult to enter the gathering grounds in any event.

There is the important and most difficult problem of NIGHT SOIL DISPOSAL already referred to, and its association with pollution of drinking and bathing waters, and with the breeding of flies. Typhoid fevers, dysenteries and diarrhoeas, and the food poisonings, in which directly or indirectly, contamination by night soil is nearly always concerned, are of crucial importance here. No mass campaigns for treatment of disease can be the final solution to this matter.

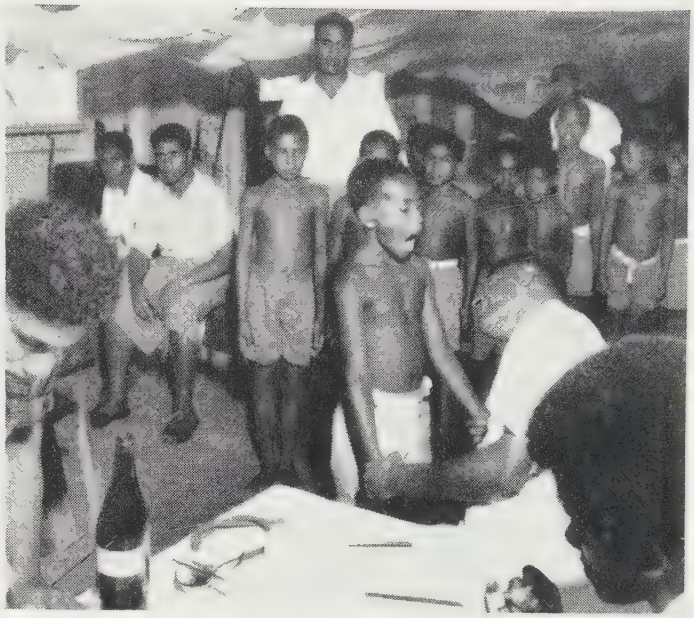
There is *finally* only one solution, and that is cleanliness, appreciation of the danger and a water-borne system of sewage disposal.

The second part of that solution is impracticable in many of these communities now, and likely to be so for many years. But there are many intermediate stages and methods between the full water carriage system and open uncontrolled defaecation. All methods, anywhere and everywhere, can work reasonably well if they are properly supervised, but in one or other way all will fail in the hands of the careless and ignorant. The means suitable to the dweller on the protected waters of the lagoon is generally impracticable on the open ocean beach; the possibilities of soft deep soil or sand may be far different to the stony subsoil of volcanic islands.

But all may be made more useful, practical and permanent by good planning and supervision, a modicum of mechanical equipment, and maybe a small subsidy of materials. It may even be that in some places a community composting scheme might conserve fertility in the soil if it were properly organised or supervised.

But the final purpose of all this is to prevent this material being a source of spread of disease directly or indirectly.

Then there is the matter of DRAINAGE, whether only of sullage water or of a complete sewage effluent, raw or treated. We have not made progress in this matter at anything like the rate we ought to have done in any country. It is a costly business to provide a sewerage scheme. The proposal to do so meets



A Fijian nurse administering a penicillin injection for yaws. Right: Assistant medical practitioner Malakai Ravai examining Fijian students at the Bucolevu Fijian School on Taveuni, Fiji, during the anti-yaws campaign.

with more opposition from governments and local bodies than from the people who will benefit. Governments want to spend, or think they must spend, their money on projects whose benefits are usually much more long range and, may we say so, frequently a good deal less fruitful or permanent. Those who control local authorities and administrations are only too often those who feel that they can endure the lack of sewerage schemes much better than the weight of the 'rate' or tax increase involved, especially so as they usually do not live in the unsewered area!

Village drainage may be simple or complicated, communal or individual, but as populations increase, and especially as water supplies and water consumption increase, so does the necessity of a system of some sort. The danger here is of the contamination of water supplies, of the accumulation of waste waters, and perhaps mosquito breeding.

Turn now to Refuse Disposal. The more highly-sophisticated a community becomes, the greater becomes the amount of domestic refuse it produces—both putrescible and non-putrescible. And accumulated refuse nearly always involves fly breeding and rat infestation in the putrescible animal or vegetable material. In the tropics, tins and bottles, to be found nowadays in the remotest places, and often in considerable numbers, can hold water and breed mosquitoes. Not much use *nearly* getting rid of yaws, of filariasis if one continues to breed flies and mosquitoes to spread the diseases from the odd missed case nearly always present. A silent process, too, only evidenced by its effects long after the offending mosquito or fly is dead, and the original infecting case untraceable.

Summary

In summary, the purpose of this paper is to consider the position with regard to the prevention and control of epidemic disease in South Pacific territories generally.

It is considered that the major epidemic diseases are reasonably prevented from entering the area by quarantine measures enforced on passengers, ships and aircraft.

The major epidemic diseases referred to are those controlled under International Sanitary Legislation, namely plague, cholera, yellow fever, smallpox, typhus, and relapsing fever.

It is considered that mass campaigns, including those against yaws, filariasis, malaria, against tuberculosis and possibly also leprosy in a few places, serve to reduce the incidence of the diseases concerned to a low level, but do not completely eradicate them. It is, therefore, necessary to ensure that general control measures, including the treatment of residual cases, but especially measures towards raising the general standards of hygiene, are essential and especially urgent in such cases, so that the diseases dealt with will not again attain a heavy incidence.

It is considered that the particular aspects of hygiene requiring attention are personal hygiene, provision of adequate water supplies, drainage and night soil disposal, refuse disposal, and prevention of overcrowding (especially of sleeping places). It is not considered that sound community health can be attained or maintained without due attention to these matters.

Co-operative Development In The Gilbert And Ellice Islands

(Continued from page 26)

complete indifference of the majority of members of the large societies, to violent partisan action to get control of the society for the benefit of some religious or other group in the smaller societies. In all cases there was an almost complete lack of any understanding of co-operative ideas and principles, and the majority of the people regarded the new societies as locally-owned companies which the government had nurtured and kept alive, and which were fair game for any tricks that members or others could play on them. This, unfortunately, was often all too easy, as the managers and storemen available were often very poorly educated as well as being, in nearly all cases, totally ignorant of book-keeping.

Popularizing Co-operation A Major Task

Having put the cart before the horse and created some thirty-two co-operative societies out of economic necessity, it has subsequently been a major task of the Co-operative Department to try to popularize the idea of co-operation among the people of the colony and teach the members of the societies the rudiments of co-operative principles and law. By making use of every available means, by lecturing, using films and the very limited broadcasting facilities available, and by holding instructional courses, some headway has been made in this respect.

(Continued on page 38)

Rat-damaged coconuts under the palms at Faaone, Tahiti, Society Islands. Not only are these coconuts a loss to copra production, but they collect rain and serve as breeding places for filaria-carrying mosquitoes.

Coconut Research Outside The South Pacific (2)

The second and concluding instalment of a survey relating to improvement of the coconut and coconut products in the South Pacific region.

By E. J. E. LEFORT*

FERTILIZATION of the coconut palm is a difficult problem. This is due to the low retention power of tropical soils with regard to fertilizers. Some remedy must therefore be found to this situation in order to make the application of chemical fertilizers a practical proposition. In a number of areas of the world, research into this problem has been undertaken with a view to discovering some means of renewing the organic matter in plantations which, on the contrary, have excellent retaining properties.

Investigations have been commenced into the effect of maintaining secondary forest growth between rows, leguminous cover plants and mulching. Conclusive surveys have been made on the use of farm manure and compost, and coconut fibre used as a mulch.

Nitrogen, phosphoric acid and potassium have an effect on the constitution of the various parts of the nut, as well as the formation of female flowers, and consequently on the number of nuts. It is therefore of prime importance to discover the requirements of the coconut palm in these various elements. For the purposes of information it may be stated that for an average yield, one hectare of coconut palm removes 18 kgs. of nitrogen, 5 kgs. of phosphoric acid and 38 kgs. of potassium from the soil, which must be replaced by annual fertilization.

Considerable progress has been made in establishing formulae for chemical fertilizers as a result of study of the mineral nutrition of plants through foliar diagnosis. The aim is to adapt the formulae to the main types of soil in order to obtain the maximum yield with the minimum of fertilizer required to promote good production.

The application of this method to coconut plantations on the Ivory Coast (French West Africa) revealed a deficiency in potassium in the soil; experiments with mineral fertilizers were then undertaken by the foliar diagnosis method. Results were positive and very significant since after three years of trials, the weight of copra per nut increased by ten per cent. and the number of nuts per palm rose by 50%, thus increasing the copra yield per hectare from an average of 700 kgs. to 2,200 kgs., 2,430 kgs. and 2,540 kgs. with respective doses of potash per tree of 0.5 kg., 1 kg., and 1.5 kgs. The practical result of mineral fertilization of coconut palms in this area was an increase in expenditure of 3,000 frs. per hectare, corresponding to an increase in income of 40,000 frs.

It should be noted that most soils carrying coconut palms are not particularly rich in clay, and that it is therefore normal to expect a deficiency in potassium in plantations. In fact, this deficiency is more pronounced in sandy soils, lateritic soils and gravels. The potassium content of the water contained in the nuts corresponds to the lack of potassium peculiar to coconut soil. It was this correlation which made it possible to evolve a method of biological analysis less complicated than that of foliar diagnosis since by a simple determination of the potassium content of the water contained in the fruit, it is possible to calculate the potash content of the soil and also the probable size of the crop.

Let us add, however, that this method is only suitable in the case of potash absorption in the coconut palm, and that analysis for any given area of land should cover at least 100 nuts in order to reduce unitary variations.

Potash fertilization trials on the coconut palm have been carried out in Ceylon on the basis of the analytical data given by the above method. The results were positive and significant since for 175 grs. to 750 grs. of potash per tree, respective increases of yield of 400 kgs. and 537 kgs. per hectare were obtained.

The study of coconut fertilization should be accompanied by the study of micro-elements necessary to its proper equilibrium, such as for instance, iron which has an effect on yield, particularly in atolls, manganese whose absence leads to disease of the leaves and influorescences, and boron whose absence leads to diseased fruit. Further, certain micro-elements may considerably reduce production even if nitrogen, phosphoric acid and potash are present in the soil in sufficient quantity.

When a series of methodical investigations on the major elements of a well-balanced fertilizer has given conclusive results, it is then necessary to consider the best method for distributing these fertilizers: application in one or several operations in either powder or granular form, superficially or in depth, around the base of the trunk, in pockets, trenches, etc. The aim is to permit the coconut to benefit to the maximum from the mineral and humic nourishment available.

Control Of Coconut Pests

This is the only field in which, thanks to the work of the Commission, certain territories and a private organization, the South Pacific is not behind other copra-producing regions. The subject will not therefore be considered here.

* Research Officer for Economic Development, South Pacific Commission.

Growing Methods

Mention will only be made here of methods which have not so far been described in the course of this report.

Soil management is a branch of research in which the following factors must be taken into account:

1: Methods to be adopted;

2: frequency of operations;

3: thoroughness of work;

4: season for operations.

These factors vary according to soil and climate, as well as the possibilities of manpower or mechanization.

Merely by concentrating on soil management, the Central Coconut Research Station at Kasaraged (India) is reported to have obtained increases in yield of about 170%.

It is often misleading to limit analysis of soil resources to a study of the standard depth, since very often the actual volume of soil utilized by the roots of the palm includes a considerable portion of the sub-soil. This often contains important reserves of fertilizing elements (with the exception of nitrogen) which could be made available to the plants by some adequate process. Among these methods, sub-soiling and drainage are particularly important, since they permit aeration of the deeper layers and enable the roots to penetrate more easily.

The depth of the seedlings, the direction in which the nut should be planted, the making of holes, the planting distances, the method and time of harvesting all require some study.

Maintenance of the plantations can be carried out by various methods such as surface ploughing, inter-row crops, keeping stock on the plantation, chemical weed control, clearing around each palm, cutting back secondary growth or by leguminous cover-plants. All these methods require preliminary trial in order to adapt and apply them to different types of soil, different climates and varying means, since such factors severely condition their establishment.

It is claimed that the cost of producing copra in the islands is much too high, and this is cause for some anxiety with regard to the future of the coconut industry in the South Pacific. It is therefore evident that improvement of the latter is in itself a major objective, but it is nonetheless evident that this objective will only be of real value provided it is accompanied by rational agricultural mechanization.

This aspect of research is not neglected in the large copra-producing areas. The first requirement is to service the equipment already existing locally and the second is the definition of modes of application of new equipment and the agricultural methods implied in relation to the nature of the soil, its relief and the climate.

A 45-year-old plantation on the Vila Teouma Road, Efate Island, New Hebrides, with a thick and uniform stand of Crotalaria sp. After neglect during wartime, the land was under a heavy growth of lantana and wild egg-plant. These were eradicated with a hormone weed-killer and immediately followed by Crotalaria. The palms of this plantation are in a very good condition and, despite small crowns, carry satisfactory crops.

II: TECHNOLOGY

A research programme in this field should be established in the light of the present-day economic situation in fats which tend to be used mainly for food purposes. It is along these lines that valorisation of coconut oil should prove most effective and that the most worthwhile markets are likely to be found.

No mention will be made here of methods used for drying and stocking copra, these aspects having been treated respectively by Mr. W. V. D. Pieris and the present author. It will merely be stated that the quantity and quality of oil to be extracted from copra vary with the seasons, methods of harvesting and drying, fertilization practices and varieties. These factors, on which the rational production of coconut oil is dependent, should be determined by chemical analysis. The improvement of control methods to obviate the two enemies of food oils—acidity and scouring—also deserve the attention of research scientists so as to improve the quality of the oil, not only in the interest of the producer but also of the consumer. It is for this reason that, in a number of oil-producing areas, advanced research is under way on the stabilization of vegetable oils.

Fractional distillation of copra oil is likewise a subject for major research, since it permits division into fluid oil and solid fat which can both be used in the food industry.

Present-day attention is centred not only on the oil which can be extracted from oil-bearing plants but also on the edible proteins to be obtained from the oil-cake. It might be worth while, rather than utilizing the oil and the cake separately, to consider manufacture of a butter, similar to the peanut butter which is widely consumed in the United States. To our knowledge, nothing has yet been undertaken in this field as far as copra is concerned, but in view of the possibilities of copra-cake there seems to be no reason why further investigation should not prove profitable.

With a view to producing super-fine copra oil, intensive research is at present underway on improvement of extraction, refining, bleaching, neutralization and deodorization techniques. Inferior grades are tending to disappear and residual oils are finding new uses. Finally, white oil obtained from desiccated coconut is attracting increasing attention.

Apart from its food uses (including fat and margarine manufacture), which form the subject of detailed research, coconut oil is also being analyzed for other branches of manufacture such as household soap, toilet soaps, soap flakes, shampoos, ointments, face creams, stearin, glycerine, chocolates, synthetic mayonnaise and desserts, certain plastics, lubricants, vegetable oil, etc.

Emphasis should be laid on the research carried out on vegetable fuels at present obtained by methanalysis (substitution of the glycerine constitution by alcohols of low molecular weight: methanolic, ethanolic) or by the action of certain bacteria on the oils.

Trials with vegetable oil in standard

On the left are two second-generation Wallis nuts, one of them split open to expose kernel. On the right is a split nut from a common plantation palm, for comparison. Note the large size of the Wallis nut in the husk, the unusual thickness of husk and length of fibre, and the outstanding size and thickness of kernel. Uvea Atoll, Loyalty Islands.

diesel engines have shown that it gave a slightly better result than gas-oil and made for smoother running. Although at the present time the use of this combustive can only be of value in certain exceptional cases, it is nevertheless comforting to realize that in a region as poorly supplied with motor power as the South Pacific, it is possible to make use of copra oil as a substitute fuel without any need for modifying the engine. Further, it should not be forgotten that import of fuels is expensive in the South Pacific and that it would be useful to have available local supplies of power, should they be required.

Apart from desiccated coconut, which is at present being studied with a view to improving production methods, attention is now being turned to fresh coconut meat, coconut milk, coconut cream, coconut crisps and specialists are attempting to discover ways of preserving and marketing them.

Research is being undertaken in the Philippines on preservation of copra and copra-cake by use of selected fermenting agents; on the reduction of the cellulose rate in the coconut meat by injecting salts or bases into the green nuts; on the separation of cellulose and carbohydrates in the cake in order to obtain a concentrated protein food which, with other ingredients added, can be used as a substitute for fish-meal as a supplement to animal feeding; and on the addition of copra-cake to prepared foodstuffs.

Coconut by-products also offer a wide field for investigation. In fact, coconut fibre is used not only for sparterie, rope-making, brush manufacture and as a packing material, but also for making fine canvases which are both durable and resistant to decay, and are beginning to be utilized in several industries such as building and sack-manufacture, to mention only the most important.

The dust and waste matter from the fibre is also dried and compressed into solid building panels, and even makes an excellent substitute for cork. Placed in a compost heap and with selected fermenting agents added, it ferments, giving off a poor gas which is identical to the manure gas commonly utilized in Europe. It should be added that a new use for fibre-dust and even for copra-cake has been found in the plastic industry.

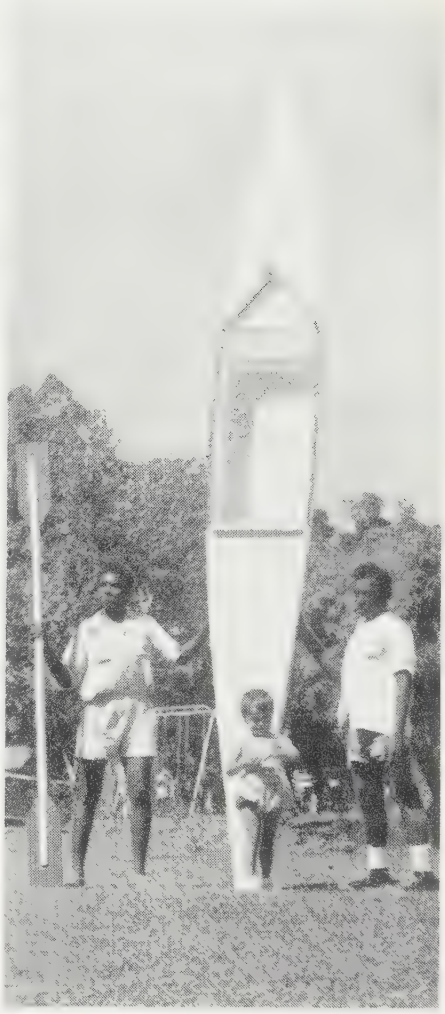
Finally, the shell, when distilled, produces an excellent absorbent charcoal, as well as pyroligneous products and tar.

In a region like the South Pacific where communications are inadequate and badly organized, the waste involved in storing and transporting copra is a heavy burden on production costs. When one considers, on the one hand, the volume of raw materials to be transported and, on the other, the quality of oil that can be extracted from poor copra, even by modern processes, one realizes the importance of undertaking research in the area into extracting oil on the spot in the producer country. Here we merely present the problem in the hope that the future will find a solution fitted to both the means and aspirations of the South Pacific.

Conclusion

At a time when the South Pacific has reached a decisive stage of its evolution it would seem opportune for specialists working in collaboration to re-consider and define the new approach to technical problems to which the scope of this brief study has been limited. In the absence of research work along these lines, combining both general objectivity with a sense of detail, it is inevitable that all efforts will come to grief over one or other of these obstacles: either to make no change in old methods *on the pretext that the South Pacific is a world apart*, or else to impose as they stand and at the risk of making enormous blunders, methods which have proved valuable elsewhere, *but only elsewhere*. There would seem, therefore, to be no alternative for our area than to follow the wise recommendation of the Third South Pacific Conference which proposes establishment of a Research Centre for improving the coconut and its products in the Commission's area of activity.

Excellent cover of Pueraria javanica in a replanted block in Tenakau, Bougainville. The cover crop has replaced weeds completely, but owing to lack of control is creeping over the coconut seedlings.



Above: Pupils assembling canoes in the playground of the Port Vila School, New Hebrides. Right: A completed canoe. Built of marine plywood, these craft are sturdy, light and seaworthy.

Port Vila School Co-operative

As a means of training pupils to participate in communal activities, school co-operatives are steadily growing in popularity throughout the South Pacific. This is the story of one such co-operative, founded at the Port Vila School by . . .

CHRISTIAN LEROY*

THE Port Vila School Co-operative was founded in March 1951. Like most other school co-operatives its aim is to educate the child through activities undertaken on a communal basis, to train the pupil to accept responsibility, to teach him how to make a society prosper, and to promote a sense of solidarity. The Co-operative also purchases for the pupils articles other than strictly scholastic equipment or textbooks which are likely to make school more congenial and education more interesting for them.

Main sources of revenue comprise small contributions from members (voluntary contributions, as there is no fixed subscription), gifts from friends of the school, sale of the co-operative newsletter *Navara*, and the annual fete.

Our Co-operative has an annual turnover of approximately 200,000 Pacific francs** (in 1955 expenditure was 170,504 francs and income, 195,520 francs).

Co-operative Activities

During the year 1955 the Co-operative organized a canteen for native pupils from homes far distant from Vila (expenditure 35,889 francs); purchased an electrophone and a sewing machine, 16mm. films, books, books for prizes, materials for handwork and drawing including poster colours, brushes, models of boats and aircraft, wood and plywood.

Main articles purchased by the Co-operative comprise a 16 mm. sound projector (1952), two projectors for slides and films (1952), printing equipment (each class has its own printing material), a crossbar and other gymnastic equipment, tools for handwork, and a microscope.

In 1954 were purchased two record players, cinematographic equipment, records and library books, and two Rally spirit duplicators; in 1955 two slide-projectors and two screens, film-strips in colour (28), five 16 mm. sound films, one magnetic tape recorder; and in 1956 an electric handsaw, an electric map of France, a roundabout for the younger children, swings, a parallel bar, a "giant's stride", a crossbar with gymnastic equipment (these five articles cost 50,000 francs), film strips in colour (67 films costing 28,500 francs).

Items on order include glassware for experiments in physics and chemistry, chemicals, mercury barometers, a spirometer for checking the respiratory capacity of the children, books for prizes (over 20,000 francs).

These details serve to show that the Co-operative lays out capital on quite important items, as well as purchasing small articles such as prizes, balloons, paper for printing the newsletter, etc.

Recent Achievements

Since 1955, pupils in the leaving class and senior classes have been building canoes. I had this idea as soon as I arrived in Vila; it surprised me to see that the young people knew little of the pleasures of the sea.

The pirogue with outriggers is heavy and difficult to handle. What was needed was some swift, light and manageable craft, and a canoe of sturdy design, fitted with watertight compartments, provided the solution. I already had more than twenty years' experience of these small boats, and the need was to make them known in Vila.

When this suggestion was put to the older pupils they were most enthusiastic.

* Mr. Leroy is former Director of French Schools in the New Hebrides.
** 178 Pacific francs equal £stg.1.

Pupils competing in a canoe race on Port Vila harbour.

Marine plywood was ordered from Sydney and a model built on a 1/10th scale. As soon as plywood and heavy wood for the framework was delivered, the boys and girls settled down to work. Each team comprised three pupils; there were seven teams for seven boats under construction.

The canoes were built in the playground. The accompanying photographs show some of the various stages: assembly of the framework, tracing the sections for cutting (which is done with an electric saw) etc. In two months the boats were ready for use.

During the 14th of July celebrations last year the canoes took part in races, and gave proof of their speed and manageability. They beat the native racing pirogues, which are remarkably well constructed.

A further contest demonstrated the seaworthiness of these small boats on a very rough sea. In this race, participants were required to cover a certain distance standing upright in their 2-foot wide boats, then to dive into the water, over-turn the boat and climb back into it to continue the race.

The canoes are used on Thursdays and Sundays; they must be reserved a few days in advance. Conditions imposed are, firstly, that the user must be able to swim well and, secondly, that the canoes are not allowed out singly.

Other Co-operative Undertakings

Another interesting achievement of the pupils, assisted by the Co-operative, was the building of a large relief map of the New Hebrides and neighbouring island groups. The map, which is constructed in cement, extends from the Banks Islands to New Caledonia, and is twelve yards long (scale 1/100,000). All heights have been multiplied 7 times.

The islands are painted in colours resembling their natural appearance. This delicate work (more than 50 islands are included, with their exact contours) is set up in the school playground, and the pupils gather around it to discuss their own travels. But the real proof of the value of this achievement is that natives from neighbouring villages are brought by friends to examine the map and locate "their" island.

Another undertaking of the Co-operative has been the purchase of pyrogravure equipment which has been used to produce articles of undoubted artistic value: engraved book-ends, album covers, bedside lamps, chess boards, etc.

Navara, our Co-operative newsletter, is highly esteemed in places in France where the Freinet techniques of school printing are practised. Its articles are frequently reproduced in the children's newspaper, *La Gerbe Enfantine,* edited by M. C. Freinet and published in Cannes.

ORIGINAL TEXT: *French.*

Co-operative Development In The Gilbert And Ellice Islands

(Continued from page 33)

By starting with the staff of the Co-operative Department itself, it has been possible to put over to the people some knowledge of the purpose of Co-operation, its history and its objects, and the rights and responsibilities of membership in a society.

It has proved impossible, with the staff available, to carry out regular inspections and audits of the societies' books, and the overall standard of book-keeping has been so low, that to audit a year's accounts it has been necessary for the auditing officer himself to prepare the accounts for audit. By breaking the large consumer-marketing societies on the bigger islands into small village co-operatives linked by an island wholesale society, it is hoped both to increase member participation in the activities of the societies and to simplify book-keeping for the island as a whole.

The most convincing proof that the idea of co-operative organization is at last gaining ground among the people, however, has come from the requests to form co-operatives for activities other than merely buying copra and selling trade goods, and at the time of writing some four producer societies are either in existence or in the process of formation.

Over Half Population Members

The co-operative movement in the Gilbert and Ellice Islands must be almost unique in that, from its first real beginnings in 1938 it has become, in eighteen years, the sole channel of economic activity in the Gilbert, Ellice and Phoenix Groups. That this mushroom growth has been due almost entirely to the economic effects of the Second World War and the active policy pursued by the Colony Government, has, in many ways, been a disadvantage which the movement must overcome if it is to be co-operative in fact as well as in name. While the record is impressive (at the time of writing there are some 32 registered island consumer-marketing societies, 8 village co-operative societies and some 5 other societies and two unions in active operation, with a total membership of 16,238, comprising some 52% of the total population of the colony and with assets of the order of £131,000) it must always be remembered that this is due to a great extent to the virtual monopoly which the movement has enjoyed in the Colony and to the consistently high price of copra since 1947. This has resulted in the lack of a vigorous membership, and the lack of spontaneous growth within the movement which is the most serious defect with which it has to contend.

In common with the position in other Pacific territories, the Gilbert and Ellice Islands' movement suffers very seriously from the lack of trained staff, both local and from overseas. This defect can be remedied in time, but, no matter how highly skilled co-operative staff may become in both the mechanics of society management and the knowledge of co-operative theory, they will not make up for the lack of a vigorous and active individual membership.

Shade Problems Of Cocoa In Papua and New Guinea

The possibility that cocoa growers in Papua and New Guinea may be providing shade for their trees that is too dense is discussed in this article by a noted authority on cocoa growing in the South Pacific . . .

D. R. A. EDEN

A cocoa plot at Keravat Agricultural Experiment Station. The shrubs are about two and a half years old and just coming into bearing. This photograph shows the overhead canopy provided by the shade trees.

WHEN I set out recently on a tour of exploration through some of the cocoa-growing districts of Papua and New Guinea I did not expect to find some of the most promising cocoa estates in the Pacific region.

In the weathered pumice soils of the Rabaul district and Bougainville Island, and in the alluvial silts of the Markham Valley near Lae, are to be found examples of developing cocoa plantations which give promise of being among the world's finest for growth and yield.

An estate of particular interest is Wanaru Plantation, a few miles from Lae, where modern methods of tropical agriculture are being used to convert old cocoa land into an orchard of young cocoa trees. A bulldozer is used to remove all the old abandoned trees and secondary growth, and for levelling the blocks.

Young hybrids are thriving beneath well-kept lines of *Leucaena glauca*. Until the trees are fully grown, it will be possible to cultivate the whole estate by machinery. The grass between the rows of cocoa and legumes is mowed by power mowers. Every tree planted in each block can be inspected from a Landrover and, if necessary, treated for disease or disorder. The soil is well mulched, and humus formed from *Leucaena* detritus lies in heavy mounds along the rows.

It is a pity that the mechanics of such an undertaking are generally beyond the financial scope of the private planter.

Rehabilitation Of Other Estates

The rehabilitation of many other cocoa estates which were planted before the Japanese occupation has been seriously undertaken. Good results have already been obtained by the removal of the undergrowth, the lessening of overhead legume shade and by reducing the height of the abandoned cocoa trees which had become too tall for economic maintenance and harvesting.

Some of these thirty-year-olds had reached a height of over twenty feet. This long-stemmed cocoa had battled for sunlight in competition with a jungle of neglected legumes and secondary growth ever since the plantations were abandoned in the early war years.

The best pruning results on the old trees, in so far as crop continuity is concerned, have been obtained by cutting back the larger cocoa branches one at a time at monthly or even longer intervals. Tree shock has thus been reduced to a minimum, and its shade factor less violently disturbed.

It was interesting to observe some of the long-abandoned cocoa which had reverted to a spindly forest type of growth. Such trees were reminiscent of African native groves of cocoa, which are invariably heavily shaded and the trees closely planted. On such trees the bulk of their crop had set upon the higher branches, and the pods seemed to be literally reaching for the sunlight. Where the overhead canopy had been lightened and the trees pruned back to let a little sunlight in, they carried substantial crops.

This observation, combined with other similar ones mentioned further on, led me to the belief that consideration should be given by planters in the Territory to a general reduction in overhead shade.

Shade Experiments At Keravat

As a result of a most interesting visit I paid to the Government Agricultural Experimental Station at Keravat, I know that experiments are well advanced there to find whether it may be recommended that cocoa in the territory should be grown with less overhead shade, or without shade at all.

It may be some time before it is possible for Keravat to release the answers to its experiments, but, speaking as a practical planter, there appeared to be sufficient visual evidence throughout the Territory for me to form the opinion that better yields could be expected with less overhead shade on the cocoa than is the accepted practice at present.

Conditions in Samoa are little different to those in Papua and New Guinea, and, in the former territory, after the cocoa is mature, overhead shade is entirely dispensed with. Quite apart from a higher incidence of black pod disease to be found among shaded cocoa trees, and consequent crop loss, optimum harvests are taken from cocoa in Samoa without overhead shade.

It was quite apparent on a number of well-maintained but heavily-shaded roadside estates in the Lae and Rabaul districts that the cocoa trees adjacent to the roads carried the heaviest crops. The trees under dense *Leucaena* shade further in along the rows and away from the light of the road clearing carried

Young cocoa trees grown from seed, about six months old. The shade trees are three years old.

comparatively few pods.

On native holdings, where gaps were observed in the plantation caused by trees having been blown over or chopped down because of disease, the trees around the little clearings so formed carried more pods than those in the heavy shade within the grove.

Again, on some of the coconut estates on Bougainville where cocoa has been inter-planted among the coconut palms, the cocoa has thrived from seedling to maturity with no more shade than that cast by the palm heads. Indeed, upon Soraken plantation, where a *Pueraria* cover crop had been well established for many years, the three-year-old cocoa showed great strength of growth and carried a crop equal to any I have seen produced upon good virgin land.

Until Keravat releases its findings on the shade experiments being conducted there, it may not be prudent for planters to eliminate all overhead shade when their cocoa trees achieve maturity, but there appears to be substantial evidence for its reduction to a density no greater than that cast by palm heads about forty feet high and spaced thirty feet by thirty feet apart.

Planters who may consider reducing their overhead shade may be well advised to reduce it gradually and not suddenly. Changes made suddenly in the degree of shade may tend to weaken a tree and promote conditions favourable to disease.

Practically all the cocoa I saw in the territory was the Trinitario type. It is usually referred to in the Pacific as the Java hybrid, presumably because the cocoa, which originated in Trinidad, was planted extensively in Java, and ultimately imported from that source for Pacific plantations during the German regime. I know that this was the case in Western Samoa, where in the early years of this century the German plantations were exclusively planted under pure Criollo, and these were decimated by canker disease. It was then that the Forastero/Criollo hybrid was imported from Java for its resistance to the canker.

Looking over some of the abandoned estates it was interesting to note the extensive use which had been made of the legume *Leucaena glauca* for shade purposes and as a legume. It struck me as being curious how the use of a certain legume becomes traditional in countries where cocoa is gown.

In Trinidad, for instance, cocoa-growers rely upon the Immortelles.[1] These are spaced 48 feet by 48 feet apart, and the highland variety towers above the cocoa rows. According to Urquhart the root nodules of immortelle trees in Trinidad contain over 4 per cent. of nitrogen, the leaves 2 to 3 per cent. and flowers 3 to 6 per cent.

Samoan planters, on the other hand, use nothing but Dadup, the *Erythrina lithosperma,* which, among the mature cocoa, is kept slashed to waist height between the rows. It would be difficult indeed to induce planters there to use any other variety of legume because they consider the *lithosperma* so compatible with cocoa, either with the seedlings or with the mature trees.

The Vai-vai, *Leucaena glauca,* is certainly the traditional legume in Papua and New Guinea. There can be no doubt that this legume provides adequate shade, a good supply of nitrogen to the soil and that it forms a useful humus from the detritus of its rotting leaves and pods. It has, however, one disadvantage. It can become a veritable weed if not continuously held under control, and vast endeavours are being made on some of the ex-abandoned estates to find an economic way to remove literally hundreds of acres of dense *Leucaena* scrub.

Vai-vai seedlings, when cutlassed, rapidly develop into multi-stemmed plants. Like Hydra heads, the seedlings sprout in doubled numbers whenever they are slashed. Grubbing the stems below ground level appears to be the only effective method for eradicating them.

Leucaena, too, has an amazing profligacy of pods. They hold numbers of seeds whose viability is seemingly endless. The pods, of course, are of value, as they contain nitrogen and rot away into the soil to form a good humus.

On young cocoa plantations *Leucaena* offers no problem, since the plants are in lines and are controlled to a single stem. Under these conditions, as soon as the cocoa matures and forms its own shade canopy over the ground, the vai-vai seedlings disappear.

On a number of coconut plantations, in order to control the weeds and grass below the palms, cocoa has been planted with the idea of shading out the undergrowth. This will make harvesting easier and more economical by reducing nut loss and growing nuts. It will, too, provide the estate with a second source of income from the cocoa.

Growers have found the palm shade sufficient to encourage the growth of cocoa seedlings, and where leguminous cover crops have been grown on the land for a sufficiently long period to ensure a good nitrogen supply, results from the inter-planted cocoa have proved most encouraging.

There is no doubt that coconut palms and cocoa trees are compatible, and the two crops thrive equally well upon a common area without any appreciable loss of soil fertility.

On old coconut land where leguminous plants have not been established for some years, a nitrogen deficiency will almost invariably be evident, and wherever this was the case the inter-planted cocoa which I observed was generally poor. Sulphate of ammonia would correct the deficiency, but its application would have to be continued

(Continued on page 48)

[1] A number of species of Erythrina, all referred to by the one common name "Immortelle". In his informative text book, Cocoa, D. H. Urquhart refers to the highland immortelle in Trinidad as *Erythrina poeppigiana* and to the lowland or water immortelle as *Erythrina glauca.* H. C. Sampson in his List of Cultivated Crop Plants gives the botanical name *Erythrina umbrosa* to the Trinidad "Immortelle".

Breeding Turtles For Profit

Following successful initial experiments, the author suggests that breeding turtles in captivity might well prove a worth-while commercial venture.

By RONALD POWELL*

Ioapa Marsters holding one of a batch of turtles which he hatched out ashore from eggs. The turtles were then kept in a wooden box anchored in the lagoon. The raised wire-netting top allows them to surface to breathe. They are fed daily with fish, shellfish and kitchen scraps.

ON Palmerston Atoll in the Cook Group, green turtles are frequently caught for food, while their eggs are often dug out of the sand and eaten.

Turtle meat is highly prized by many people, while the shell is of some commercial value. During a recent visit to the Atoll it occurred to me that it might be possible to develop a new industry in these islands by breeding turtles in captivity.

Two preliminary attempts have given encouraging results. Ioapa Marsters (who attended the recent SPC fisheries training course in Nouméa with me) hatched out 30 eggs and kept the young turtles in a wire-netting covered wooden box floating in the lagoon. They are fed daily with kitchen scraps, fish and shellfish. The accompanying photographs show the turtles at ten months. If they could be fed to two or three years, I am sure that they would find a ready sale in Rarotonga and possibly in New Zealand.

As a further experiment, during another visit to Palmerston Atoll we took six small turtles aboard the *Charlotte Donald*. For the trip back to Rarotonga we kept them in a drum, changing the water daily.

Here they are kept ashore in water that is half fresh, half seawater, and are fed on anything we can give them, ranging from fresh fish to tinned beef and rice. They are omnivorous feeders, and do not seem to require any special food to gain weight.

Locating Turtles' Eggs

The supply of turtle eggs on Palmerston Atoll is fairly plentiful. Though difficult to find for a stranger, the islanders are quick to spot tracks which the female leaves when prospecting for a likely site to lay her eggs. They can tell by the way the sand has dried how old the tracks are. They then return on the twelfth night from the time the first turtle comes ashore, and wait just beyond highwater mark. If there is a rough sea on the reef and the turtles are unable to get ashore, the egg seekers return on succeeding nights to keep further watch.

Turtle eggs are laid in a hole in the sand, which is surprisingly deep when one considers that the young turtles breaking their way out of the egg must find their way to the surface. From around seventy to occasionally over two hundred eggs are laid in each hole—one can hardly call it a nest as it is not lined or prepared in any obvious way. After its eggs are laid the turtle scatters sand over the surface, and except from the tracks, which lead off some distance away, it might be impossible to locate the eggs at all. They are generally found by thrusting a thin sharpened stick down into the sand. It is quite easy to see when it has passed through several eggs, and the rest are then quite easily dug out.

Island children often take the eggs back to the village and plant them in a similar hole in the white sand. A ring of sticks prevents the young turtles from heading straight for the lagoon should they break surface while not being watched.

Turtle Fishing A Regular Activity

Fishing for turtles is a regular part of atoll activity. Many are speared from canoes, others are caught by paddling a canoe up to them very silently, then grabbing them by the shell or one flipper.

A turtle has no sharp protective armour, but it must be handled with a degree of skill which has to be learned by experience. There are no teeth in the jaws but there is a sharp bony edge, sharp enough to nip off a finger should anyone mistakenly take hold of the front edge of the shell.

It is a common sight in an atoll for a large turtle to be made fast by a strong rope in the lagoon, so that young boys can learn to hold it the correct way and swim on its back. A skilled fisherman can leap onto a large turtle and, taking hold of the fore and after ends of the shell, can steer it until help arrives. There *have* been men who have been carried down into deep water and have been unable to surface again, but such cases are fortunately very rare.

On the outer reef there are several deep surge channels where turtles are known to sleep at nights in caves. These channels, which are from three to four fathoms deep, are full of all kinds of fish during the day. Sharks cruise off them and snap up any maimed or injured fish.

Particularly vicious moray eels live in holes leading off from the channels. When I lived on Palmerston Atoll every

* Marine Division, Department of Agriculture, Cook Islands Administration.

DEMKA

Agencies Pty. Limited

SYDNEY

EXCLUSIVE MANUFACTURERS' REPRESENTATIVES IN THE

Pacific Islands

FOR:

W. J. BUSH & CO. (AUSTRALIA) PTY. LTD.
Sydney—Melbourne—London

BOSTON INDUSTRIES PTY. LTD.
Sydney

BRITISH UNITED DAIRIES PTY. LTD.
Melbourne

BRUYNZEEL FACTORIES
Zaandam (Holland)

BRADFORD COTTON WEAVING MILLS (VIC.) PTY. LTD.
Melbourne

BORNEO SUMATRA TRADING CO. LTD.
The Hague, Osaka, Hong Kong, Durban, Djakarta, Singapore, etc.

BRELLA PTY. LTD.
Melbourne—Sydney

BALLARAT BREWING CO. LTD.
Melbourne

COLONIAL SUGAR REFINING CO. LTD.
Building Materials Division, Sydney

J. CROWLEY & CO. PTY. LTD.
Sydney

D.A.K. MEAT PACKERS LTD.
Roskilde (Denmark)

GLAZEBROOKS PAINTS (Aust.) PTY. LTD.
Melbourne—Sydney

LAN CHOO TEA COMPANY
Sydney

LEECHMAN & CO. LTD.
Colombo (Ceylon)

MAXWELL PORTER & SON, LTD.
Sydney

WILLIAM MURRAY & CO. LTD.
Glasgow (Scotland)

PLASTALON PTY. LTD.
Melbourne—Sydney

SCOTTS' DETERGENTS (A/SIA) PTY. LTD.
Sydney

E. VAN DE SANDT N.V.
Rotterdam (Holland)

JOHN ZEVENBOOM & CO. PTY. LTD.
Melbourne—Sydney

Cable Address:
DEMKAY, SYDNEY

Postal Address:
2-12 CARRINGTON STREET SYDNEY

Two of the turtles bred in captivity at ten months of age.

(Continued from page 41)

islander carried scars on feet and legs from eel attacks, some men limping for the rest of their lives from particularly bad bites.

By daylight the channels are particularly interesting places to watch, as there are so many fish of almost endless variety swimming in with each surge of the ocean surf which thunders across the reef. By night they harbour other species of predatory fish, and the deep dark shadows under ledges and in caves are another world altogether.

I have never felt any desire to swim there, but several of the islanders regard night fishing for turtles in these channels as great sport. They slip quietly into one, and swimming under water will grab a sleeping turtle from a deep coral cave.

Papua and New Guinea Uses S.I.T.C. For Classifying Imports And Exports

AS from 1st July, 1955, the import and export statistics of the Territory of Papua and New Guinea have been classified on the Standard International Trade Classification (S.I.T.C.) basis.

Since June 1950, when the E.C.O.S.O.C. of the United Nations adopted the S.I.T.C., it has played an increasingly important role in the field of international trade statistics. In addition to its use as the basic classification of the U.N. and the specialized agencies for the collection and publication of statistics, the S.I.T.C. is being adopted by an increasingly large number of countries as their primary national trade classification. Other customs areas in the South Pacific Commission region may be interested in the reasons why the territory of Papua and New Guinea took the decision to adopt this basis.

What is S.I.T.C.? It is a systematic method of classifying commodities. The 570 items included cover all commodities of international trade in a summarized form. These can be subdivided into a much larger number of commodities for internal national usage if so desired. The items are arranged into 150 groups; the groups in turn are assembled into 52 divisions summarizing the groups according to their broader characteristics. Finally, the divisions are consolidated into general broad economic categories called sections. The classifications are expressed in a numeric code which uses the decimal system. The sections provide the first digit, the divisions the second and so on. An item has five digits and for additional classifications to suit internal national needs sixth and subsequent digits can be added.

For example *Section* 6 covers "Manufactured goods classified chiefly by material". *Division* 65 is "Textile yarn, fabrics, made-up articles and related products". *Group* 652 covers "Cotton fabrics of standard type (not including narrow and special fabrics)". *Item* 652-02 is "Cotton fabrics, other than grey (bleached, dyed, mercerized, printed or otherwise finished)". Statistics for international publication are classified and grouped only as far as the item. For

national purposes, however, the country may break down the item into 10 sub-items by adding a sixth digit. The breakdown can be on any basis desired, e.g., finish, quality, width, weight, etc. Should such a breakdown be insufficient a seventh digit could be added so that 100 sub-classifications are available for internal purposes.

As a further example, the breakdown of beverages as used in Papua and New Guinea is quoted below. The breakdown shows the use of statistical sub-items and follows the customs tariff items.

SECTION 1. BEVERAGES AND TOBACCO

DIVISION 11. BEVERAGES

111	NON-ALCOHOLIC BEVERAGES	
111-01.1	Aerated and Mineral Waters	gallon
111-01.2	Cordials and Syrups	
112	ALCOHOLIC BEVERAGES	
112-01.1	Wine, sparkling	gallon
112-01.2	Wine not exceeding 27% p.s.	gallon
112-01.3	Wine exceeding 27% p.s.	gallon
112-01.4	Wine imported by missions for sacramental purposes.	
112-02	Cider and fermented fruit juices, n.e.s.	gallon
112-03	Beer (including ale, stout, porter) and other fermented cereal beverages	gallon
112-04.1	Brandy	gallon
112-04.2	Gin	gallon
112-04.3	Whisky	gallon
112-04.4	Rum not exceeding the strength of proof	gallon
112-04.5	Rum exceeding the strength of proof	Proof gallon
112-04.6	Other potable spirits and spirituous liquors N.E.S., not exceeding the strength of proof	gallon
112-04.7	Other potable spirits and spirituous liquors exceeding the strength of proof	Proof gallon

What are the advantages of S.I.T.C.? The obvious advantages of course are in the international field, as it enables complete comparability to be attained between trade statistics of all nations. Generally, however, countries desire to see a direct benefit to themselves in addition to furthering an international cause. If all countries adopted S.I.T.C. they would derive an indirect benefit from the greater amount of easily-understood and fully comparable trade information which would assist them in their own trade problems. This would apply particularly to the great trading nations (such as the United Kingdom) which export a multiplicity of processed goods, rather than the less developed areas which depend on the export of a relatively small number of primary products. (Possibly this is one of the reasons why the United Kingdom adopted S.I.T.C. some time ago.) However, in this article, it is desired to concentrate on the more direct benefits rather than on the indirect international benefits which are open to a country assuming S.I.T.C.

S.I.T.C. should cope with all demands on a country's trade statistics for all time. Many systems of trade statistics were originally designed so as to serve a

The Man Behind it All . . .

The development of the Territories of the South Pacific is an example of the spirit of the pioneer builders of all nations.

Those men met, and overcame, obstacles not found in other parts of the world; yet there is still more work for men with a pioneering spirit who are prepared to leave the beaten track of better developed and more settled places.

One advantage "The Man Behind It All" has today is the widespread use of air services and wireless. These two modern services keep him closely in touch with the outside world, while all the advantages of modern machinery, technical and scientific knowledge are at his disposal.

In addition, he has the benefits of modern insurance to protect him against losses in his undertakings and it is our privilege to make this specialised assistance available to all those engaged in commercial undertakings and to individuals in all walks of life.

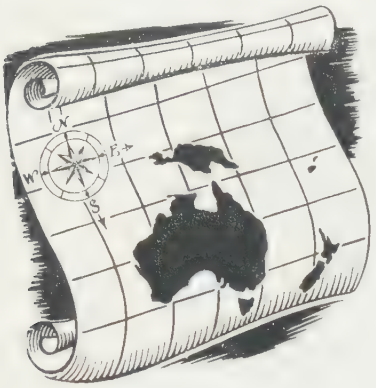
When it's Insurance—Talk it over with us.

HARVEY TRINDER

Insurance Brokers

SYDNEY: 267 George Street. BO 546
BRISBANE: Cnr. 240 Queen and Edwards Sts. FA 2147
PORT MORESBY: Port Road. Telephone 2373

Insurances at Lloyd's and Companies



For all banking services . . .

First and largest trading bank in the South-West Pacific, the Bank of New South Wales provides banking services at over 900 points throughout Australia, New Zealand, Fiji, Papua and New Guinea.

Residents and visitors are invited to avail themselves of the "Wales" complete banking service at the following centres:—

FIJI

Branches: Suva, Lautoka, Nadi, and Ba.
Agencies: Nadi Airport, Vatukoula, Sigatoka, Raki Raki, and Tavua.

PAPUA

Branches: Port Moresby and Samarai.
Agency: Boroko.

NEW GUINEA

Branches: Bulolo, Lae, Madang, Rabaul, and Goroka.
Agencies: Kokopo and Wau.

You can bank on the "Wales"

Consult and use—

BANK OF NEW SOUTH WALES

FIRST AND LARGEST TRADING BANK OPERATING IN AUSTRALIA NEW ZEALAND, FIJI, PAPUA AND NEW GUINEA

(INCORPORATED IN NEW SOUTH WALES WITH LIMITED LIABILITY)

A5536a

particular interest of a particular nation at a particular time. Frequently they were not even this, as so many countries adopted the bases used by other countries and imperfectly adapted them for their own statistical needs. As the nation's trade interests changed over a period of time their statistical bases were found to be insufficiently elastic to cope with the different circumstances. They had to be amended and rearranged and thus incurred the disadvantage of the loss of comparability with previous years. The S.I.T.C., being on a logical and systematic basis, is capable of expansion or contraction so as to cover the wide variety of conditions which might be met over a long period of time. Even if it is so expanded or contracted it still retains intact the framework which maintains its comparability with the statistics of other S.I.T.C. countries.

Having adopted the S.I.T.C. the country will find that it will be able to group the commodities in a number of ways and that the grouping will be consistent and comparable. Frequently a country's trade figures appear in a number of publications under different groupings, or special studies are taken out for special purposes. If the figures are based on S.I.T.C. they will remain consistent throughout and there will be no need for copious footnotes and reconciliations with other forms of presentation.

The decimal system used is ideally suited for card punching and sorting without the need for further coding. This applies not only to primary sorting but also to any further grouping or cross-tabulation by the machinist.

Finally, most major nations already forward their trade figures to the United Nations Statistical Commission in S.I.T.C. form, i.e., S.I.T.C. is a supplementary classification to their primary national trade classification. The annual re-arranging of national classified data into the framework of S.I.T.C. is an awkward and not highly satisfactory task. National items often need to be broken down or re-grouped (sometimes somewhat arbitrarily) into S.I.T.C. items. Adoption of S.I.T.C. for internal national purposes would avoid this task.

What are the disadvantages of S.I.T.C.? Why do not all countries adopt it immediately? Apart from normal Government inertia and the work which is necessary in rearranging the statistics, the major disadvantage is the loss of continuity and comparability with previous years. However, as time passes, a new body of figures is built up and the information of previous years becomes progressively less significant. If a start is to be made then the sooner the better. Nevertheless, much additional work is involved in cross-tabulating the old and the new bases for a sufficient period until the old basis becomes relatively unimportant.

Why did Papua and New Guinea

adopt S.I.T.C.? Possibly S.I.T.C. would not have been introduced at this stage except for a combination of local circumstances. There had been a need for accelerating the publication of the trade figures for some time and it was found necessary to replace hand tabulation with machine tabulation. The Commonwealth Statistician came to the assistance of the Administration and assumed the task of machine tabulation. It was necessary to adopt a new basis of classification for the initial machine coding, and the ready-made S.I.T.C. basis was found to be ideally suited for this purpose.

Quite apart from the need for earlier presentation, improvement in the content of our trade figures was desirable. A more detailed breakdown of imports and more information on quantities imported was required. These improvements might have been brought about by a process of gradualism, but owing to the chronic shortage of staff in the territory it would probably have been a long-term process. By the adoption of S.I.T.C. these improvements have been brought about automatically. Also, the territory has a statistical framework which should meet all future needs, and the figures will be comparable with those of the growing body of countries which have adopted S.I.T.C.

The Pacific Islands and the S.P.C.

SINCE the war the School Publications Branch of the New Zealand Department of Education has published regularly a Post-Primary School Bulletin for use in New Zealand's post-primary schools. The various numbers have ranged over a wide field of important subjects in history, geography, science and literature, and have made a most significant contribution to much of the schools' work. Their worth, as authoritative and well-written publications, has come to be increasingly appreciated by New Zealand post-primary teachers and pupils, for they are, almost without exception, good in their own right as well as being valuable teaching aids.

Now, just ten years after the Agreement establishing the South Pacific Commission was signed in Canberra on behalf of the participating governments, there has been published in the series a number with the title *The Pacific Islands and the South Pacific Commission*, the author of which is C. G. R. McKay, New Zealand's Senior Commissioner on the South Pacific Commission since its establishment. Mr. McKay's intimate knowledge of the Commission and his considerable Pacific experience have enabled him to bring to his task the authority that such a publication demands.

The content, appropriately illustrated, has been dealt with in three main sections, the first of which is devoted to a

Let the B·N·Z help you

WITH YOUR BANKING IN THE PACIFIC—

The Bank of New Zealand provides complete commercial and personal banking services. If you do business in the Pacific, or intend taking an Island holiday, your every need is provided for.

★ Export and Import Facilities ★ Currency Exchange ★ Financial Transactions ★ Trade Informatian and Introductions ★ Collections and Payments ★ Travellers' Cheques ★ Letters of Credit ★ Safe Custody ★ General Advisory Service ★ Travel Arrangements, Bookings, etc. ★ Savings Deposits (Fiji).

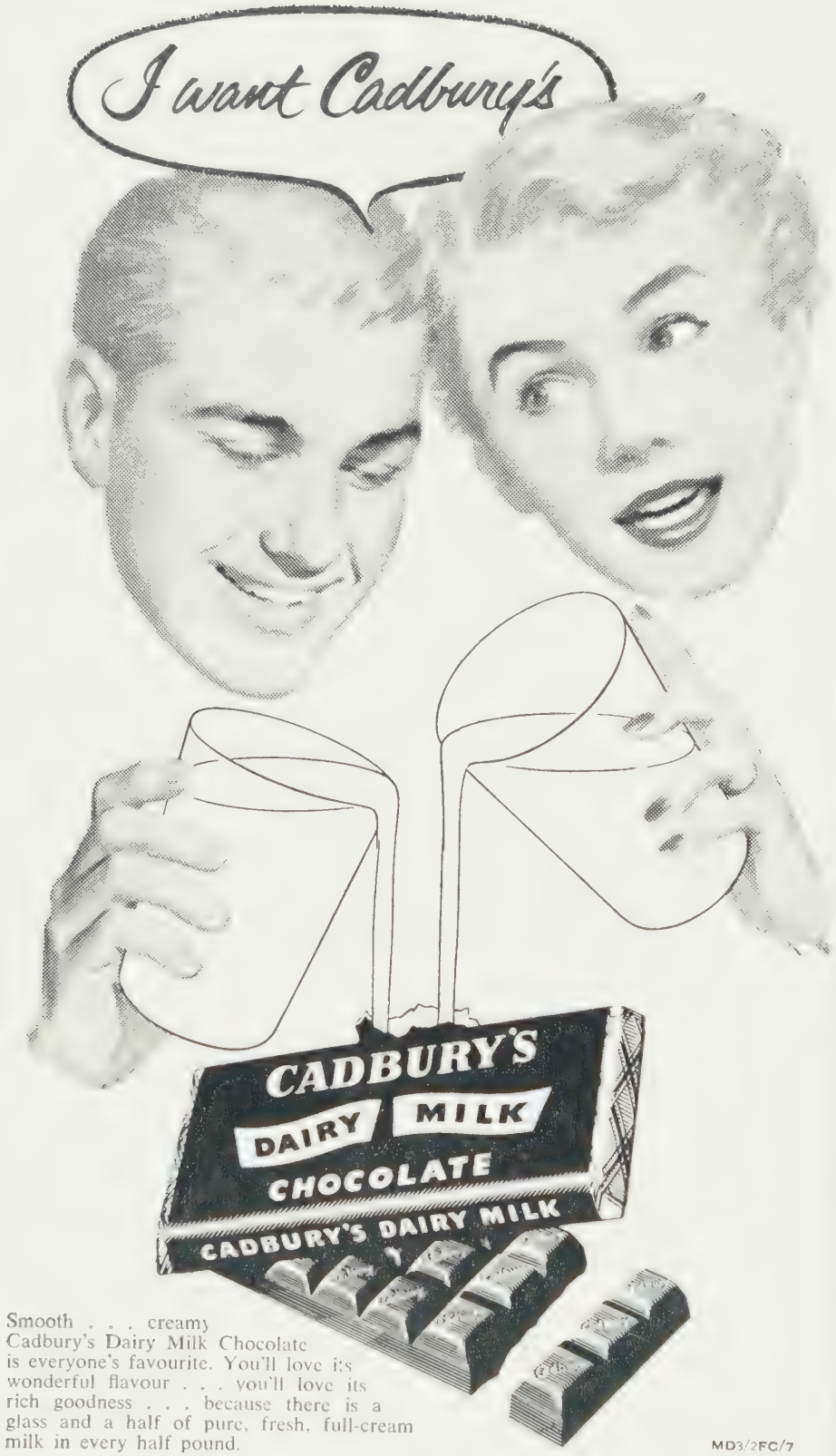
BANK WITH THE BNZ

Full Branches of the B.N.Z. are established at: SUVA, LAUTOKA, LABASA, NADI and BA (Fiji) and APIA (Samoa).

Agencies in Fiji at MARKS ST., SUVA, LAUCALA BAY AIRPORT and NAUSORI.

BANK OF NEW ZEALAND

Established in the Pacific Islands since 1876.



Smooth . . . creamy Cadbury's Dairy Milk Chocolate is everyone's favourite. You'll love its wonderful flavour . . . you'll love its rich goodness . . . because there is a glass and a half of pure, fresh, full-cream milk in every half pound.

MD3/2FC/7

CADBURY'S DAIRY MILK CHOCOLATE

brief outline of cultural, geographical and historical differences among the Pacific's island territories and peoples, with a useful sub-section on settlement and trade.

Against this background the second section deals with the establishment of the Commission and its major purposes, working methods and the functioning of its various services, Research Council, and study groups. The important part that the Commission can play in bringing together islanders from all over the Pacific to discuss their problems and to exchange ideas is well developed in the context of the South Pacific Conference, the description of which forms the third section.

The task of dealing with so much in such a concise publication cannot have been an easy one, and the way in which the author has succeeded in keeping the various aspects in proper perspective, in writing clearly and effectively, and above all in making the account as lively as he has is ample proof that the task was put in safe hands.

Educators throughout the world are becoming increasingly interested in methods whereby school children of various countries may become acquainted with the international responsibilities which their respective countries have assumed and with the ways in which these responsibilities are being met. The publication under review provides a splendid example of one method by which this can be done.

By itself, of course, it cannot do the whole job, but as an authoritative base from which lessons, discussions and projects can be effectively developed, it can do a great deal to help teachers handle not only Pacific questions, but also the wider question of international co-operation in a setting so thoroughly practical as to be immediately meaningful.

Many of the teachers who will make good use of this publication will doubtless share the reviewer's opinion that it merits a much wider circulation.—*R.S.*

PICTURE CREDITS

Acknowledgement is made for photographs reproduced in this issue as follows: Front cover, pages 19 (left), 21, Louis Devambez; 14, 28 (top), A. Sylvain, Papeete; 15, 16, 17, W. V. D. Pieris; 18, 29, 32, 33, Fiji Official; 19 (right), 20, Michel Gug; 22, 23, P. B. Cadell; 27, 39, 40, Australian Official; 28 (bottom left), 31, Netherlands Official; 37, 38, Christian Leroy; 41, 42, Ronald Powell.

Transplanting Trochus In The Eastern Pacific

By H. van Pel*

TROCHUS shell is a commodity much in demand on the world market and it can be relied on to command a good price. So a good cash income can be earned in many islands of the South Pacific where the shell is found.

In most of the western half of the area where the South Pacific Commission is working, the island reefs are inhabited with *Trochus niloticus*, but there still remain many other reefs where this useful money-spinner has never been seen. In the island waters East of Fiji (longitude 176°W), there is no record of *Trochus niloticus*, but we have inspected reefs where the living conditions would be suitable for them.

Accordingly, acting on our advice, the Cook Islands Administration has gone ahead with transplantation of trochus from Fiji to Aitutaki. Two transplantings have now been made, and, although some trochus did not survive the journey, both are reported to have been successful.

The second transplanting was made by two students of the South Pacific Fisheries Training Course, R. Powell and I. Marsters, and they and the Resident Agent from Aitutaki have confirmed that the trochus previously transplanted were alive and had moved out over the reef, some being already beyond the breakers.

The shells of the first transplanting were carried in tins of sea-water; those for the second transplanting were carried dry in crates. Both were made by aircraft. During the second transplanting the aircraft flew at 5,000 feet, where the temperature dropped to 68°F., but with six 24-volt bulbs around the crates the temperature was kept up to 75°-85°F. These shells were planted on the reef, and, from inspections made the following day and three days later, seemed to be settling into their new quarters.

On a visit to French Oceania in March-April last, a number of reefs were found in various islands where trochus could be established with good expectation of success. As a result of some advice given in this regard at the end of our visit, the territory of French Oceania has made plans for a transplantation of 1,000 trochus, to commence in late May.

It is expected that more transplantings of trochus will take place in the South Pacific. However, it would be advisable in each case to have an investigation carried out by a qualified expert before any plans are made for the actual introduction of the shell in order to ensure it will take place under the best possible conditions.

* Fisheries Officer, South Pacific Commission.

A.N.Z. Bank provides progressive banking service* throughout the South-West Pacific

A call or enquiry from you at any of the following Branches will be welcomed.

Port Moresby - Mr. F. A. S. Robertson, Manager
Lae - - - Mr. A. A. Watts, Manager
Rabaul - - Mr. G. M. White, Manager
Suva - - - Mr. W. C. G. Roberts, Manager
Lautoka - - Mr. R. J. Hogan, Manager

**Our free booklet, "Bank Accounts for Everyone," is now available at all A.N.Z. Bank branches. Ask for your copy.*

A.N.Z. BANK

AUSTRALIA AND NEW ZEALAND BANK LIMITED — *Cheque Accounts*
AUSTRALIA AND NEW ZEALAND SAVINGS BANK LIMITED — *Savings Accounts*

ANZ393 2FC

Wear's worst enemy!

World-Famous Mobiloil— helps assure longer engine life . . . smooth, quiet operation . . . maximum fuel and oil economy. Because Mobiloil is a super-detergent, heavy-duty motor oil, it fights corrosion . . . helps prevent deposits . . . protects at all speeds and temperatures. Why accept anything less? Costs a little more maybe, but well worth it.

VACUUM OIL COMPANY PTY. LTD.

Shade Problems Of Cocoa In Papua And New Guinea

(Continued from page 40)

periodically until legumes are planted and become established.

On the coconut plantations where cocoa has been successfully interplanted, the high palm heads will determine all shade problems, but, since the coconut is not a legume, the source of a future nitrogen supply for the cocoa trees is a matter for consideration. The element supplied by the original cover crop will not last long after the vines become shaded out.

Since most of the new inter-plantings of cocoa have been spaced 15 feet by 15 feet apart, and soil fertility in the territory is developing the hybrids into large trees with a good spread in the branches, their laterals at those distances should interlock with their neighbours. This being so, the cocoa should form a full canopy of shade over the land and will eradicate all leguminous cover crops, the seedling growth of *Leucaena* or other tree legumes and most weeds and grasses. This will ensure the easy harvesting of coconuts, although cocoa branches will be lopped off occasionally by falling nuts and bomboms.

On those combined coconut and cocoa estates where no tree legumes exist, the real problem, after the ground cover legumes have been shaded out, will be to provide a continuing nitrogen supply. Cocoa demands a nitrogen-enriched soil, but legumes will not grow in dense shade. Open spaces must therefore be found to plant tree legumes, be they vai-vai, dadup or immortelles.

Coconut-cum-cocoa planters who have not already provided for lines of tree legumes may have to sacrifice some cocoa trees at appropriate distances and establish the legumes in their places in the cocoa lines. If this is done it should be an easy matter to regulate their height by pruning or slashing, if it is considered that legume shade plus palm shade will be too dense for the best results from the cocoa. I am inclined to the belief that it may be.

Standardized Grading For Pacific Copra

(Continued from page 18)

which must not be exceeded in the various qualities.

With regard to the segregation of the various grades when they are shipped, the matter is a technical one involving stowage, and should not be finally decided upon without reference to an appropriate authority in the shipping field. In any case, a shipping company's agreement to any plans of this nature would have to be gained before a charter agreement could be concluded.

PACIFIC READING

Material in this section is contributed by the South Pacific Commission Literature Bureau. Any enquiries relating thereto should be directed to Box 5254, G.P.O., Sydney, Australia.

Notes and News

Filmstrip Appraisal Service. Advice has been received from Educational Productions Ltd., of East Ardsley, Wakefield, England, of a free Dual Preview Service intended to assist those who use educational filmstrips. This service offers people the opportunity of seeing any of this firm's selection of filmstrips for a period of seven days entirely free of charge and without obligation to purchase, thus facilitating selection of exactly what is required. It is available to all educational authorities and schools throughout the world. The 1957 catalogue, listing over 450 titles of subjects at different teaching levels, and full details of the Preview system are available on request from Education Productions Ltd.

Leaflet for Netherlands New Guinea. A five-colour Malay version of the leaflet *Fruit Juice for Baby* has been produced through the Literature Bureau for the Government of Netherlands New Guinea. Single specimen copies of this leaflet are obtainable on request from the Literature Bureau, Box 5254 G.P.O., Sydney, N.S.W., and we shall be glad to supply also, production costs of similar leaflets to anyone requesting them.

A First Hygiene Book. Stocks of this book were completely exhausted shortly after publication; however, the second impression of the three original editions—designed for the New Hebrides, Papua and New Guinea, and the Trust Territory of the Pacific Islands—have now been produced and are available from the Literature Bureau, Box 5254 G.P.O., Sydney, N.S.W., Australia, at A.3s. a copy plus postage.

Wealth From the Coconut. At the request of the Government of the Gilbert and Ellice Islands Colony, a Gilbertese version of *Wealth From the Coconut* by W. V. D. Pieris is now being printed; it will be produced in exactly the same format as the other ten editions which have so far been produced for the Pacific.

Reading Occupation Sheets. The Literature Bureau is arranging for the printing, on behalf of the Education Department of the Territory of Papua and New Guinea, of some reading occupation sheets. Single specimen copies of these will be available to territories, free of charge, on request from the Literature Bureau.

Health Leaflet. In co-operation with the Health Department of the Territory of Papua and New Guinea the Literature Bureau is producing an illustrated leaflet for the "Tina" series entitled *Keep Your Baby Clean*. The leaflet describes in very simple English the correct way to bath a baby and is designed for use at village level.

Wallchart Appraisals. The increasing use of films and filmstrips in visual education has frequently tended to obscure the value of the wallchart as a teaching aid; yet in many instances, these charts, in the hands of a skilful teacher, can be used with great effect in imparting information on some particular topic. During the past few years, increasing numbers of attractively produced charts on a wide range of topics have become available and we now feel that appraisals of some of this material would be of considerable interest to educationists and teachers in the Pacific area. The first of these reviews appears at the end of the visual aids section of this issue and we hope to include similar information on other charts in future issues.

Films on Some Aspects of Islands Life. Reviews of seven interesting 16 mm. silent documentary films depicting various aspects of native life in Tonga and Fiji are published in the Visual Aids section of this issue. These films were made during 1951-52 by Dr. G. Koch, a well-known German anthropologist, under the auspices of the German Research Association, and provide an insight into some aspects of Pacific Island life. Five of the films deal with life in Tonga, whilst the other two show the method of making pottery in Fiji; we are indebted to Dr. G. Koch and the German Consul-General in Australia for their co-operation in readily making available copies of these films for appraisal purposes.

ENGLISH TODAY

R. Davidson

This new magazine is designed to help, inform and amuse 12-15 year-olds who have been learning English as a foreign language for a year or more. It has serial stories, strip cartoons, games, songs, puzzles and competitions, all illustrated by lively drawings and photographs. Published monthly in the school year (October to June). *Fewer than 10 copies—1s. 3d. each;* per year, *10s. 10 or more copies—1s. each;* per year, *8s. 6d.*

DAVID LIVINGSTONE

G. Annesley and V. Gordon

A simple account of the life of a man who dedicated himself to the service of the African people. By persistent efforts he did much to hasten the abolition of the slave trade, which less than seventy-five years ago ravaged the African tribes from coast to coast. *Illustrated. 2s. 6d.*

MACMILLAN & CO. LTD.

St. Martin's Street, London, W.C. 2

BOOK LIST No. 17

Items reviewed have been chosen for their general interest or for their relevance to educational and development problems in the South Pacific area. Wherever possible the price stated is the published price in the country of origin.

THE BOOMERANG BOOK OF LEGENDARY TALES. Ed. E. H. Heddle, Melbourne: Longmans, Green; A.18/9. 1957. pp. 150. Illust. (*Boomerang Books*).

There are thirty-six folk tales in this book: seventeen from Australia, seven from Micronesia, five from Borneo, two from New Zealand, and one each from New Guinea, Tonga, Fiji, the New Hebrides, and the Solomon Islands. The book has been very attractively produced and many of the black-and-white drawings which form head and tail pieces to some of the legends are excellent. Although the legends have been selected from a wide area of the Pacific, certains aspects of many of them are similar, and this should make them of interest not only in the places where they originated but also elsewhere. Although most of the legends have been translated from Australian aboriginal and Pacific Island vernaculars, an attempt has been made in many of them to retain the flavour of the original language and thought patterns. This is an altogether excellent book and should prove of interest to adults and in secondary schools and libraries in the Pacific.

HEROES DOWN THE AGES. R. E. Howard. Yule Island, Papua: Comet Press; Price unknown. 1956. pp. 71.

This book contains about fifty very brief and fairly simply written biographies of famous politicians, scientists, explorers, authors, artists, missionaries, and historical and Biblical figures from 2000 B.C. to the present day. A few pages at the end of the book are devoted to some "Heroes" from Papua and New Guinea—nearly all of whom are connected with the missions. This book, like many others which we receive these days from the Pacific, shows that increasing attention is being paid to production standards and it has been printed in a good clear type and its pages are well laid out. It would be interesting to see similar books produced but entirely devoted to biographies of well-known island people.

INTRODUCING THE SAILOR. John Hornby. London: Macmillan; stg.2/6. 1955. pp. 64. Illust. (*The 'Introducing' Series.*)

This is the first title in a new series of factual readers about people in various occupations. The book is divided into two parts of approximately equal length; the first deals with the sailor in the British Merchant Service, and the second with the sailor in the Royal Navy. The part dealing with the Merchant Service, first outlines briefly Britain's dependence on shipping her coal, then deals with imports and exports, and continues by describing the development of the Merchant Service. It then describes present day conditions in the Service in various parts of the world in a number of different types of ships. Part II describes the early history of the Royal Navy and its functions and methods of operation in both war and peace. The book is too small to be comprehensive but it is simply written and it does give a good general introduction to its subject and may be welcomed in the islands at about 5th-6th year of English level.

KEY WORDS FOR EASY SPELLING. T. J. Fitikides. London: Longmans Green; stg.2s. 1955. pp. 64. Illust.

Teachers will have their own ideas about the best way of teaching English spelling; dictation, reading, and memory drill in spelling lists all have a part to play. However, the essentially practical nature of this little book should appeal to all practical teachers engaged in the turmoil of the classroom. In it a rule for a particular spelling procedure is given, and a key word illustrating this procedure is printed in red for the pupil to memorize; then follows a number of examples of, and common exceptions to, the particular procedure. The book contains sixty such key words, each illustrating some important rule, and each being accompanied by examples and exceptions in the way just described. Each section of the book is clearly numbered, and it is here that we see the hand of the experienced classroom teacher, for as the author says *"Key Words for Easy Spelling* is the pupil's reference book on his spelling problems. An example from the book itself will make my point clear. Let us suppose that a pupil has written the word 'careful', or some other word ending in *-ful,* with double *l* instead of one *l* —which is, of course, a common mistake. The teacher underlines the word and refers the pupil to the Key Word dealing with his mistake by a number in the margin of his exercise book (in this particular case '19') to enable him to look up the Key Word and correct his mistake."

It seems to us that this method by continuously obliging the pupil to correct his mistakes, not by reference to just a single word in a dictionary or spelling list, but by reference to a general rule, illustrated by other examples and exceptions, must produce highly beneficial results.

The two-colour illustrations, while giving an attractive lift to the appearance of the pages of the book, may prove rather beyond the island primary school children for whom the book should be most valuable.

CONCISE ENCYCLOPEDIA OF GENERAL KNOWLEDGE. S. G. Brade-Birks & F. Higenbottam. London: English Universities Press Ltd.; stg.10s. 1956. pp. xii-535. Illust. (*Teach Yourself Books.*)

As far as we are aware, no Encyclopedia in English has yet been prepared especially for newly-developing countries, but there is a growing number of single-volume Encyclopedias in English becoming available. Many problems are encountered in establishing libraries for islands peoples of the Pacific; among these problems is the provision of reasonably simple and inexpensive works of reference. The single-volume encyclopedia is often, therefore, found particularly useful in island libraries, and we have little hesitation in recommending this one. It does live up to its title: the entries are concise—which naturally leads to some dogmatism and generalization, but perhaps this isn't altogether a bad thing—and it does cover a fairly wide field of general knowledge. Although the entries employ a fairly extensive vocabulary, they are noteworthy for their clarity of expression. This encyclopedia has been designed mainly for use in the United Kingdom, and gives preferential treatment to features which are primarily of interest there; for instance, geographical articles are more detailed for the United Kingdom than elsewhere. One of its special features —a lengthy article on how to obtain further information— will have little applicability in the Pacific where works of general reference are often difficult to obtain; but the book may, nevertheless, be welcomed in many island libraries and will perhaps assist in providing suitable reference material and solving immediate problems or points on which there has been some controversy. The book is almost pocket size, i.e. pages of 6¾ inches by 4¼ inches; the type is set in double columns and although fairly small, is clear and easily legible; some of the articles have been illustrated with black-and-white drawings.

PAPUA AND NEW GUINEA IN PICTURES. E. P. W. Marriott. London: Macmillan & Co.; stg.4s. 1956. pp. 96. Illust. (South Pacific Commission Literature Bureau publication.)

This is an elementary social studies book and the extensive ground it covers is indicated by its chapter headings, which are: "Our Country and How People Live In It", "Different Kinds of Houses", "Our Old Customs", "What Europeans Have Brought", "New Kinds of Village Work", "The Wealth of the Country", "Transport". Each left hand page of the book carries half-tone illustrations and is faced by an appropriate text in simple English; a two-page map of Papua and New Guinea appears in the introductory pages. Although this book has been prepared primarily for the native peoples of the area, we feel that it will be of interest outside, as well as inside, the territory, and not only to the native peoples, but also to Europeans as there is a dearth of well-illustrated reading material dealing with Papua and New Guinea. Mr. W. C. Groves, Director of Education in Papua and New Guinea, says in his foreword to the book: "Apart from its value for social studies purposes, I feel that this book could also be particularly valuable in helping to meet the everyday needs of the increasing number of people who wish to practise and develop their skill in reading English". The text has been prepared by Mr. E. P. W. Marriott, who has been engaged for some years in educational work in the territory. Copies are obtainable from booksellers in the United Kingdom at stg.4s. a copy, or from booksellers in Australia at A.7s. 6d.

MAN MUST MEASURE. Lancelot Hogben. London: Rathbone Books. Stg.15s. 1955. pp. 69. Illust.

"I cannot too highly recommend this masterpiece of simplification without falsification" is Bertrand Russell's comment on this book. The very high standard of production of this book, and the excellent, numerous, coloured illustrations—several on each page—have tended to make the book somewhat expensive, but it is very good value for anyone's money. The book describes the way in which many fields of the progress of civilization have been dependent on the discovery of mathematical principles. It contains, therefore, not only much information on mathematics, but also links this subject with social studies throughout the ages. It covers a very wide field and shows many stages of development in measurement from the earliest days when man learnt to measure time from the sun, moon, and stars, to the function of measurement in the technical marvels of the present time. The text has been made as simple as is possible, taking into account the complexity of the subject with which it deals. The book is an excellent example of how it is possible to prepare material in such a way that it will be of interest not only to children but also to adults. The importance of this aspect of the book will be readily recognized by everyone in the Pacific who is interested in providing reading material for adult island peoples. The problem which is constantly encountered in finding suitable reading material in this field is that when a book is sufficiently simply written, it is often unacceptable to the sophisticated adult because it is obviously written primarily for children. However, since the second world war, publishers have not only greatly improved production standards, but have also—or at least some of them have—given considerable thought to the preparation of reading material which will appeal to people of all ages. This book, and one or two others that have been produced in the last few years, are new ventures in publishing which will be welcomed in newly-developing areas where English is not the mother tongue. *Man Must Measure* is recommended for libraries everywhere and for the sophisticated island adult with a reasonably good knowledge of English.

THE PENGUIN ATLAS. Ed. J. S. Keates, London. Penguin Books. Stg.10s. 1956. pp. 80. Illust.

Perhaps the most significant aspect of this new atlas is its small size, i.e., 5¾ in. x 8½ in. It contains eighty pages of six-colour maps, each section being introduced by a continental map showing the principal features of relief and vegetation. The index contains 15,000 entries, and it has been planned before the maps to encourage full use being made of it.

Country names, and those of international features, such as seas, great mounain ranges, etc., have been given their traditional English forms. Place names within any country have been spelt in the manner officially adopted by that country or its administering authority, or in a recognized English transliteration. However, alternative versions of all important names, including both traditional English forms, and foreign names which have been changed since the Second World War, have been cross-referenced in the Index. The atlas offers, at a moderate cost, a coverage and treatment which is midway between school atlases and the weighty and more expensive tomes, and will, no doubt, be welcomed by many people who require something reasonably detailed, but inexpensive, for everyday use.

ART FOR AFRICAN SCHOOLS. N. F. Stanfield. London: Evans Brothers Ltd., London; stg.4s. 6d. 1956. pp. 77. Illust.

This is the best book we have yet seen on the teaching of art in tropical areas. Two difficulties are often encountered in teaching art in these areas: the high cost of materials, and the fact that teachers sometimes think they have no ability to teach the subject because they are not competent artists. This eminently practical book shows the way to overcome both of these problems. The first chapter is devoted to a description of the materials which can be used in art work. It describes methods of drawing pictures in sand and mud with a stick, and explains how these methods can teach children freedom of expression and give them the opportunity to work, as they often wish to, on a large scale, and with little or no cost involved; these materials can be used in the classroom too, providing trays can be made to contain the sand or mud. Another economical drawing material mentioned is newspaper, which can be used for art work either as it is, or if a white surface is required, painted with whitewash, which has the additional advantage of stiffening the paper. Cement-bag paper, which is easily obtainable in some places, is another low cost material. The chapter on materials also describes how to make: bamboo pens, quill pens, feather brushes, chew-stick brushes, rope-stick brushes, and how to make and use various colours from local materials. These examples of the practical issues dealt with in this book illustrate well that it is down-to-earth. The second chapter, entitled "Drawing", describes the method of teaching which should be employed, and how children's interests and abilities progress and how they should be encouraged to develop their work. Other chapters deal with: pattern making; teaching aids simply made from local materials; and lettering and colour. Throughout the book emphasis is placed on encouraging children to develop their own interests and abilities, and information is given on the way some children develop these characteristics spontaneously while others sometimes need thoughtful suggestions and encouragement. The book has been printed on good quality paper and there are numerous black and white illustrations.

FROM SMALL BEGINNINGS. Professor E. N. da C. Andrade. London: Macmillan & Co. Stg. 3s. 6d. 1954. pp. 89. Illust.

Did you know that when radio first came into use, many unusual happenings and bad weather were attributed to its introduction, exactly as they are now attributed to atomic bombs? This is just one of the many interesting points that Professor Andrade has woven into this very readable account of simple but great scientific discoveries that later became the key to many of our present-day complex electrical devices.

Based on a series of six television talks given by the author in 1953 the topics covered are: The Beginning of Magnetism; The Electric Current Makes a Magnet; The

Magnet makes an Electric Current; The Electric Current Goes through a Gas, and what came of it; Light and Heat Release Electricity; and The Reproduction of Sound.

The book is illustrated with a number of photographs and line drawings, and it should prove suitable for general reading in Secondary schools or for adult readers.

KO E KELEKELE A NIUE. (Soil of Niue.) A. C. S. Wright. N.Z. Department of Education (School Publications Branch) for Department of Island Territories, New Zealand: Price unknown. 1956. 48 pages. Illust.

This class-activity book has been designed to acquaint school pupils in Niue with the importance of soil conservation and care, and to show what steps must be taken to ensure the future maintenance of fertility in their soil. Written by A. C. S. Wright of the Soil Bureau, Department of Scientific and Industrial Research, the text—which is in the Niuean language—is based on a soil survey programme undertaken previously to determine the causes of low agricultural productivity on the island. The book has been well produced and attractively illustrated with black-and-white line drawings and a two-colour cover, and is a good example of a well-designed school text book.

TROPICAL FOOD AND NUTRITION. (No. 4. November, 1956). South Pacific Health Service, Fiji. F.9d. (postage 3d.). 24 pages. Illust.

The purpose of this well-produced booklet, issued by the South Pacific Health Service, Fiji, is aptly summarized in the following quotation from its editorial pages: "Many of the foods grown in the Pacific Islands are very nutritious as well as being extremely appetising. One of the aims of *Tropical Food and Nutrition* is to describe these foods and suggest the best ways of using them." With this theme, the issue under review contains such articles as—"Feeding Pacific Island Babies"; "Questions and Answers about Bananas"; "Potato Substitute—Breadfruit"; "Are You Overweight?" "Duruka Recipes"; and "The Outdoor Kitchen", all of which provide much practical information on food and nutrition and are designed to make the routine of housekeeping and family care easier and less humdrum. Domestic science teachers and pupils, and adult women with a good knowledge of English should find this book extremely useful; copies can be purchased from Nutritionist, South Pacific Health Service, Box 13, Suva, Fiji.

VISUAL AIDS

Films in the Commission library are marked with an asterisk before the title, and are available for viewing by any metropolitan or territorial government on application to the Executive Officer for Social Development, Box 5254, G.P.O., Sydney, N.S.W., Australia. Age classifications, where given, are intended as a guide rather than a recommendation.

Films

SEVEN FILMS ON SOME ASPECTS OF PACIFIC ISLANDS LIFE. 16 mm. Silent. Institut fur den Wissenschaftlichen Film. Germany. Prices as below.

TONGAN FILMS

DORFLEBEN IM TONGA-ARCHIPEL. (Life in the Village in the Tongan Archipelago.)

Part I. Am Morgen—Mattenherstellung—Koprabereitung. (In the Morning—Making of Mats—Making of Copra). Film No. C.657/1954. Price 84 DM (approx. £stg.7).

Part II. Herstellung von Rindenstoff-Nachmittagsmahlzeit-Kirchgang (Making Materials from Bark—Afternoon Meal—Going to Church). Film No. C.658/-1954. Price 106 DM. (approx. £stg.9).

Part III. Kawa—Gesellschaft und Tanze (Kava—Party and Dancing). Film No. C.659/1954. Price 106 DM. (approx. £stg.9).

TONGANER IN IHREN PFLANZUNGEN. (Tongans in Their Plantations). Film No. C.661/1954. Price 128 DM. (approx. £stg.10 15s.).

FISCHFANG IM TONGA-ARCHIPEL. (Fishing in the Tongan Archipelago). Film No. C.662/1954. Price 84 DM. (approx. £stg.7).

FIJIAN FILMS

TOPFEREI IN FIDSCHI. (Pottery in Fiji).

Part I. Herstellung von Kochtopfen (Making of Cooking Bowls). Film No. C.663/1954. Price 84 DM. (approx. £stg.7).

Part II. Herstellung von Wasserchalen aus dem Vollen (Making Water Bowls in One Piece). Film No. C.664/1954. Price 128 DM. (approx. £stg.10 15s.)

These seven excellent documentary films were produced during 1951/52 by Dr. G. Koch, a well-known German anthropologist, under the auspices of the German Research Association. Five of the films deal with life in Tonga and the remaining two cover pottery making in Fiji; each provides a valuable record of some aspects of indigenous life and crafts of the area. Of the Tongan films, three are devoted to life in the village and show something of the daily activities of a Tongan family—opening scenes show the family waking up, preparing their food and feeding animals, and are followed by sequences describing such activities as weaving mats from pandanus, preparing and drying copra, making bark cloth and printing designs on it, making fishing nets, going to church, and finally there is a kava-drinking ceremony, and a party with traditional dances.

The remaining two Tongan films deal with agriculture and fishing pursuits. The former describes the planting and harvesting of staple foods such as sweet potatoes, taro, bananas, yams and manioc, and the latter shows various fishing methods ranging from simple spear fishing and net fishing to deep sea trolling. Two further films are devoted to pottery making in Fiji and depict the various stages in the production of coconut pots and water bowls—sequences show the women kneading the clay with their feet, glazing the water bowls and firing the finished pots in a simple fire made from coconut fronds. The films are silent, but a small booklet (in German), illustrated with sketch and diagrams, and containing additional information on each film, is supplied. The photography is generally good throughout the series although at times, especially towards the end of a sequence, the editing could have been improved. These films contain a good deal of information and should be of value to all having an interest in Pacific Islands life. Copies can be purchased on application to: Institut fur dem Wissenschaftlichen Film (Institute for Scientific Films) Gottingen, Bunsenstrahe 10, Germany.

HANDSAWS. Size 20-in. x 30-in. Colour. Published by Educational Productions Ltd., London. Published price stg.1s.

This attractive, well produced chart depicting the construction, use and care of various types of hand-saws is divided into three sections —a large central panel, taking up about two-thirds of the entire sheet, describes the main parts of a hand-saw and shows by means of enlarged drawings the set and sharpening angle of the rip, crosscut, tenon and dove-tail saws. Clear captions explain concisely the rules of sawing and indicate the type of work for which each saw is intended. The left hand panel consists of three clear diagrams which describe the recommended method of using a saw, whilst on the right hand side the correct method of topping, shaping, setting and sharpening a saw is illustrated. All drawings have clear lettering and the sheet could be used to advantage in schools where woodworking subjects are taught.

QUARTERLY READING LIST No. 21

A Bibliography of Publications relating to Social Development in the South Pacific.

THIS reading list represents an attempt to note every item in the field of Social Development in the South Pacific during the past six months. The list will in future appear every six months, instead of quarterly, as before. The entries are drawn from numerous periodicals, which are regularly examined, as well as from bibliographies, publishers' notices and similar material. Publications of the South Pacific Commission have not been indexed. Items marked with an asterisk have not been seen in the Social Development section.

Copies of items listed will gladly be obtained for metropolitan or territorial Governments by the Social Development Section, G.P.O. Box 5254, Sydney.

SOUTH PACIFIC—GENERAL

(1) BELSHAW, Cyril S.: Price's "Adventure in paradise": a review. *Far Eastern Survey*, vol. 25, no. 8, Aug. 1956. p. 128.
(2) FIRTH, R. W.: Mander's "Some dependent peoples of the South Pacific": a review. *Pacific Affairs*, vol. 29, no. 4, Dec. 1956. pp. 398-400.
(3) LOHSE, Bernd: Lander der sehnsucht, Australien und Sudsee heute. Frankfurt, Umschau Verlag, 1953. pp. 212.*
(4) NEWMAN, E. V.: Currents in the South Pacific. *The International Review of Missions*, vol. 46, no. 181, Jan. 1957. pp 11-16.
(5) RAITT, Helen: Exploring the deep Pacific. Norton, New York, 1956. pp. 272.*

Anthropology

(6) BORNEMANN, F.: P. W. Schmidt's Studien uber den totemismus in Asien und Ozeanien. *Anthropos*, vol. 51, 3-4, 1956. pp. 595-734.
(7) HAEKEL, Josif: Heyerdahl's "American Indians in the Pacific": a review. *Anthropos*, vol. 51, 3-4, 1956. pp. 801-806.
(8) KLARWILL, P. E.: Koch's "Sudsee—gestern und heute": a review. *The Journal of the Polynesian Society*, vol. 65, no. 4, Dec. 1956. pp. 360-361.
(9) SIMMONS, R. T.: A report on blood group genetical surveys in Eastern Asia, Indonesia, Melanesia, Micronesia, Polynesia and Australia in the study of man. *Anthropos*, vol. 51, 3-4, 1956. pp. 500-512.

Art

(10) DODGE, Ernest S.: Hewicker and Tischner's "Oceanic art": a review. *American Anthropologist*, vol. 58, no. 1, Feb. 1957. pp. 152-153.
(11) DODGE, Ernest S.: Wingert's "Art of the South Pacific Islands": a review. *American Anthropologist*, vol. 59, no. 1, Feb. 1957. pp. 152-153.
(12) FRICK, Joh: Hewicker and Tischner's "Kunst der Sudsee": a review. *Anthropos*, vol. 51, 1-2, 1956. pp. 381.
(13) SCHMITZ, Carl A.: Style provinces and style elements: a study in method. *Mankind*, vol. 5, no. 3, Sept. 1956. p. 107-116.

Bibliography

(14) ——. "Bibliotheca missionum. Missions literatur von Australien und Ozeanien": a review. *Anthropos*, vol. 51, 1-2, 1956. p. 391.

Botany

(15) CRANSTONE, B. A. L.: Merrill's "The botany of Cook's voyages": a review. *Man*, vol. 56, articles 106-128, Aug. 1956. pp. 115-116.

Geography

(16) SHAW, Earl B.: Cumberland's "South west Pacific": a review. *The Journal of Geography*, vol. 51, no. 2, Feb. 1957. p. 90.

Fishing

(17) BURGMANN, A.: Anell's "Contribution to the history of fishing in the Southern Seas": a review. *Anthropos*, vol. 51, 1-2, 1956. pp. 380-381.

Health

(18) BLACK, Robert H.: The epidemiology of malaria in the Southwest Pacific: changes associated with increasing European contact. *Oceania*, vol. 27, no. 2, Dec. 1956. pp. 136-142.

History

(19) EMMERICH, H.: Beaglehole's "The journals of Captain James Cook on his voyage of discovery. Vol I: The voyage of the Endeavour, 1768-1771": a review. *Anthropos*, vol. 51, 3-4, 1956. pp. 764-766.
(20) OSBORNE, Douglas: Beaglehole's "The journals of Captain James Cook on his voyages of discovery, Vol. I: The Voyage of the Endeavour, 1768-1771": a review. *American Anthropologist*, vol. 58, no. 6, Dec. 1956. pp. 1170-1171.

THIRD SOUTH PACIFIC CONFERENCE

(21) SAYERS, C. E.: The South Pacific Conference. *Corona*, vol. 8, no. 10, Oct. 1956. pp. 365-368.

MELANESIA

Anthropology

(22) ——. Simpson's "Islands of men": a review. *The Colonial Review*, vol. 9, no. 7, Sept. 1956. p. 218.
(23) H.A. —— Elkin's "Social Anthropology in Melanesia": a review. *Anthropos*, vol. 50, 4-6, 1955. p. 1026.
(24) KASPRUS, Alois: Leenhardt's "Do Kamo": a review. *Anthropos*, vol. 51, 1-2 1956. pp. 379-380.
(25) KURATH, Gertrude P.: Schmitz's "Balam": der tanz- und kultplatz in Melanesien als versammlungsort und mimischer schauplatz": a review. *American Anthropologist*, vol. 58, no. 6, Dec. 1956. p. 1152.
(26) WURM, S.: Schmitz's "Balam: der tanz- und kultplatz in Melanesian": a review. *Oceania*, vol. 27, no. 1, Sept. 1956. pp. 70-71.

Development and Welfare

(27) BELL, F. L. S.: Belshaw's "Changing Melanesia: Social economics of culture contact": a review. *Mankind*, vol. 5, no. 3, Sept. 1956. pp. 123-124.

MICRONESIA

Anthropology

(28) DAMM, H.: Mikronesische kultboote, schwebealtare und weihegabenhanger. *Jahrbuch des Museums fur Volkerkunde zu Leipzig*, 13, 1954. pp. 45-72.*
(29) F. B. ——: Stillfried's "Die soziale organization in Mikronesien": a review. *Anthropos*, vol. 50, 4-6, 1955. p. 1025.
(30) FRICK, Joh: Schlesier's "Die erscheinungsformen de mannerhauses und das klubwesen in Mikronesien": a review. *Anthropos*, vol. 51, 1-2, 1956. p. 378.

POLYNESIA

Anthropology

(31) CRANSTONE, B. A. L.: Danielsson's "Love in the South Seas": a review. *Man*, vol. 56, articles 106-128, Aug. 1956. p. 116.
(32) FIRTH, A.: A note on descent groups in Polynesia. *Man*, vol. 57, articles 1-17, Jan. 1957. pp. 4-8.
(33) H. A. ——: Keesing's "Social anthropology in Polynesia": a review. *Anthropos*, vol. 50, 4-6. p. 1026.

Art

(34) BARROW, T. T.: Human figures in wood and ivory from Western Polynesia. *Man*, vol. 56, articles 192-210, Dec. 1956. pp. 165-168.

SOUTH PACIFIC COMMISSION

(35) ROBERTS, Bruce: The functions and organization of a literature bureau. Part 2. *Fundamental and Adult Education*, vol. 8, no. 1, Jan. 1956. pp. 11-16.

BRITISH SOLOMON ISLANDS

Anthropology

(36) FIRTH, Raymond: Ceremonies for children and social frequency in Tikopia. *Oceania*, vol. 27, no. 1, Sept. 1956. pp. 12-55.
(37) OLIVER, Douglas: Birket-Smith's "An ethnological sketch of Rennell Island: a Polynesian outlier in Melanesia": a review. *American Anthropologist*, vol. 58, no. 1, Feb. 1957. pp. 180-181.
(38) VOYCE, A. H.: Oliver's "A Solomon Island society: kinship and leadership among the Siuai of Bougainville" a review. *The International Review of Missions*, vol. 46, no. 181, Jan. 1957. pp. 106-108.

Folklore

(39) BRADLEY, Diana: Notes and observations from Rennell and Bellona Islands, British Solomon Islands. *The Journal of the Polynesian Society*, vol. 65, no. 4, Dec. 1956. pp. 332-341.

FIJI

Anthropology

(40) CATO, A. C.: Disintegration, syncretization and change in Fijian religion. *Mankind*, vol. 5, no. 3, Sept. 1956. pp. 101-106.

General

(41) HARRINGTON, Richard: Fijian train-ride. *The Geographical Magazine*, vol. 29, No. 7, Nov. 1956. pp. 320-324.
(42) HARRINGTON, Richard: Fiji's famous constabulary. *Walkabout*, vol. 23, no. 4, April, 1956. pp. 36-38.
(43) HARRINGTON, Richard: Where the rails are free (Viti Levu, Fiji Island). *Walkabout*, vol. 23, no. 1, Jan. 1957. pp. 41-42.
(44) HARTWELL, R. M.: "South Pacific enterprise": a review. *The Australian Quarterly*, vol. 29, no. 1, March, 1957. pp. 113-116.
(45) J. T. ——: "South Pacific enterprise": a review. *Pacific Islands Monthly*, vol. 27, no. 7, Feb. 1957. pp. 80-81.
(46) KINGSMILL, N. T.: Fijian stamps of King Cakobau's reign. *The Etruscan*, vol. 6, no. 4, March, 1957. pp. 32-33.
(47) THOMAS, F. C.: Fijian progress. *The Etruscan*, vol. 6, no. 2, Sept. 1956. pp. 4-7.

History

(48) CUMPSTON, I. M.: Sir Arthur Gordon and the introduction of Indians into the Pacific: the West Indian system in Fiji. *Pacific Historical Review*, vol. 25, no. 4, Nov. 1956. pp. 369-388.

FRENCH OCEANIA

Anthropology

(49) BERNARD-MAITRE, Henri: Leroi-Gourhan and Poirier's "Ethnologie de l'Union française": a review. (Vol. 2 deals with Asia, Oceania and America.) *Anthropos*, vol. 51, 1-2, 1956. p. 347.
(50) DANIELSSON, Bengt: Work and life on Raroia. An acculturation study from the Tuamotu Group, French Oceania. Stockholm, Saxon and Lindstroms Forlag, 1955. pp. 244.*
(51) HAUSE, H. E.: Muhlmann's "Arioi und Mamaia: eine ethnologische, religionssoziologische und historische studie uber Polynesische kultbunde": a review. *American Anthropologist*, vol. 58, no. 3, June 1956. p. 582.
(52) MONBERG, Torben: Ta'aroa in the creation myths of the Society Islands. *The Journal of the Polynesian Society*, vol. 65, no. 3, Sept., 1956. pp. 253-281.

Description

(53) HARRINGTON, Richard: Tahiti—pearl of the South Pacific. *Walkabout*, vol. 23, no. 2, Feb., 1957. pp. 31-34.

History

(54) ——: Rowe's "Voyage to the amorous islands. The discovery of Tahiti": a review. *The Geographical Journal*, vol. 122, part 2, June, 1956. pp. 265-266.
(55) Les "informations" du Messager de Tahiti en 1856. *Bulletin de la Société d'Etudes Océaniennes*, vol. 10 (no. 1), no. 114, March 1956. pp. 509-516.
(56) Les "informations" du Messager de Tahiti en 1857. *Bulletin de la Société d'Etudes Océaniennes*, vol. 10 (no. 2), no. 115, June, 1956. pp. 531-537.

(57) Les "informations" du Messager de Tahiti en 1857-1858. *Bulletin de la Société d'Etudes Océaniennes,* vol. 10 (no. 3), no. 116, Sept. 1956. pp. 575-578.
(58) Les "informations" du Messager de Tahiti en 1858 (suite). *Bulletin de la Société des Etudes Océaniennes,* vol. 10 (no. 4), no. 117, Dec., 1956. pp. 605-609.

Missions
(59) JORE, L.: La goelette "Notre-Dame-de-la-Paix". *Bulletin de la Société d'Etudes Océaniennes,* vol. 10 (no. 3), no. 116, Sept., 1956. pp. 579-589.

NAURU

Description
(60) BARBOUR, W. C.: Wealth among the coral. *The Etruscan.* vol. 6, no. 3, Dec., 1956. pp. 38-39.

NEW CALEDONIA

Description
(6) PRIDAY, Lew: Magic metals bring unprecedented prosperity to New Caledonia. *Pacific Islands Monthly,* vol. 27, no. 5, Dec., 1956. pp. 37-43.
(62) WRIGLEY, Helen M.: New Caledonia—Australia's exotic next door neighbour. *Walkabout,* vol. 22, no. 10, Oct., 1956. pp. 17-20.

Geography
(63) P. ———: Faive's "Geographie de la Nouvelle Caledonie": a review. *Pacific Islands Monthly,* vol. 27, no. 3, Oct., 1956. pp. 77-79.

History
(64) LEENHARDT, R. -H.: Fao, L'apôtre de Lifou. (1842-1863). *Le Monde non Chrétian,* Oct.-Dec., 1956. pp. 301-313.

NETHERLANDS NEW GUINEA

Agriculture
(65) Commissie van advies inzake de agrarische ontwikkelings-mogelijkheden in Nieuw-Guinea. Agrarische ontwikkelingsmogelijkheden in Nieuw-Guinea. The Hague, 1955. p. 232.*

Anthropology
(66) ANDREOLI, E.: Van "wilde" mensen met deugden en gebrecken. *Nederlands-Nieuw Guinea,* vol. 4, no. 4, July, 1956. pp. 6-8.*
(67) CAPELL, A.: Pouwer's "Enkele aspecten van de Mimika-cultuur (Nederlands Zuidwest Nieuw Guinea)": a review. *Oceania,* vol. 27, no. 1, Sept. 1956, pp. 69-70.
(68) EECHOUD, J. P. K. van: De neuzencultus van de Papoea. *Oost en West,* vol. 49, no. 9, Sept. 1956. pp. 10-11.*
(69) GALLIS, K. W.: De grotten van jaand. *Nieuw Guinea Studien,* vol. 1, no. 1, Jan. 1957. pp. 14-23.
(70) KEUR, Dorothy L.: Pouwer's "Enkele aspecien van de Mimika-cultuur (Nederlands Zuidwest Nieuw Guinea)": a review. *American Anthropologist,* vol. 58, no. 5, Oct., 1956 pp. 938-939.
(71) LEEDEN, A. C. van der: Hoofdtrekken der sociale struktuur in het westelijke binnenland van Sarmi. Leiden, 1956. xii, pp. 188.*

Art
(72) CAPELL, A.: Kooijman's "De kunst van Nieuw Guinea": a review. *Oceania.* vol. 27, no. 1, Sept., 1956. pp. 66-68.
(73) GUNN, H. D.: Kooijman's "De kunst van Nieuw Guinea": a review. *American Anthropologist,* vol. 58, no. 4, Aug., 1956. pp. 767-768.

Development and Welfare
(74) DIJKSTRA, I.: Aspecten en perspectieven van de welvaartsbevordering in Nederlands-Nieuw Guinea. *B.B.-Blad,* vol. 3, no. 4, Dec. 1955. pp. 45-53.*
(75) HANRATH, J. J.: Kouwenhoven's "Nimboran: a study of social change and social-economic development in a New Guinea society": a review. *Nieuw Guinea Studien,* vol. 1, no. 1, Jan,. 1957. pp. 84-85.

General
(76) ANDEL, H. van: Om de toekomst van Nederlands-Nieuw Guinea. *Anti-revolutionaire staatskunde,* vol. 26, no. 8, Aug. 1956. pp. 213-227.*

Health
(77) BIJLMER, H. J. T.: van der Hoeven's "Resultaten van een onderzoek naar voeding en deficiente-verschijnselen bij autochthone zuigelingen in Nederlands Nieuw Guinea": a review. *Nieuw Guinea Studien,* vol. 1, no. 1, Jan., 1957. pp. 85-86.
(78) HOEVEN, J. A. van der: Possible causes of the high infant mortality in Netherlands New Guinea. *Documenta de medicina geographica et tropica,* vol. 8, no. 3, Sept., 1956. pp. 281-286.*
(79) VOORS, A. W.: Health education in Netherlands New Guinea. *Nieuw Guinea Studien,* vol. 1, no. 1, Jan., 1957. pp. 24-30.

Land Tenure
(80) VERHOEFF, H. G.: Overheid en grond in Nederlands-Nieuw-Guinea; beginselen van agrarisch beleid. *Nieuw Guinea Studien,* vol. 1, no. 1, Jan., 1957. pp. 31-58.

Linguistics
(81) CAPELL, A.: Drabbe's "Spraakkunst van het Marind": a review. *Oceania,* vol. 27, no. 1, Sept., 1956. pp. 66-67.
(82) DOORENMAALEN, W. A. L. van: Het Nederlands als voertaal in Nederlands-Nieuw-Guinea. *Schakels,* 1956, NNG.22. pp. 26-30.*
(83) HALL, Robert, A. Jr.: Drabbe's "Spraakkunst van het Marind": a review. *American Anthropologist,* vol. 58, no. 4, Aug., 1956. pp. 762-763.

NEW HEBRIDES

Anthropology
(84) GUIART, Jean: Culture contact and the "John Frum" movement on Tanna, New Hebrides. *Southwestern Journal of Anthropology,* Spring 1956.*

General
(85) HILDER, Brett: Aneityum: island of hurricanes. *Walkabout,* vol. 22, no. 12, March, 1957. pp. 29-32.

PAPUA AND NEW GUINEA

Agriculture
(86) McAULEY, J. P.: Problems of agricultural organisation. *South Pacific,* vol. 9, no. 3, Nov.-Dec., 1956. pp. 330-336.
(87) MILES, J. Native commercial agriculture in Papua. *South Pacific,* vol. 9, no. 2, Sept.-Oct., 1956. pp. 318-327.

Anthropology
(88) BERNDT, Ronald M.: The changing world in New Guinea. *The Australian Quarterly,* vol. 29, no. 1, March, 1957. pp. 39-55.
(89) BLACKWOOD, Beatrice, and Danby, P. M.: A study of artificial cranial deformation in New Britain. *The Journal of the Royal Anthropological Institute,* vol. 85, parts I and II, Jan.-Dec., 1955. pp. 173-191.
(90) BURRIDGE, K. O. L.: A note on Tangu dreams. *Man,* vol. 56, Articles 129-149 Sept., 1956, pp. 121-122.
(91) COON, Carleton S.: Mead's "New lives for old": a review. *Natural History,* vol. 65, no. 7, Sept., 1956. pp. 340-342.
(92) DUNN, Diane, and others: The blood groups of a third series of New Guinea natives from Port Moresby. *Oceania,* vol. 27, no. 1, Sept., 1956. pp. 56-63.
(93) H. A. ——. Simpson's "Adam in Plumes": a review. *Anthropos,* vol. 50. 4-6, 1955. p. 1026.
(94) HALL, Basil: The string-bag people (Papua, New Guinea). *Walkabout,* vol. 22, no. 11, Nov., 1956. pp. 15-16.
(95) HALL, Basil: The well-dressed man (Trobriand Islands). *Walkabout,* vol. 23, No. 2, Feb. 1957. pp. 41-44.
(96) IVINSKIS, V., and others: A medical and anthropological study of the Chimbu natives in the Central Highlands of New Guinea. *Oceania,* vol. 27, no. 2, Dec. 1956. pp. 143-157.
(97) LUZBETAK, L. J.: Worship of the dead in the Middle Wahgi (New Guinea). *Anthropos,* vol. 51, 1-2, 1956, pp. 81-96.
(98) MEGGITT, M. J.: The valleys of the Upper Wahgi and Lai Rivers, Western Highlands, New Guinea. *Oceania,* vol. 27, no. 2, Dec. 1956, pp. 90-135.
(99) SALISBURY, Richard F.: Asymmetrical marriage systems. *American Anthropologist,* vol. 58, no. 4, Aug. 1956, pp. 639-655.
(100) WATSON, James B.: Simpson's "Adam with arrows: inside aboriginal New Guinea": a review. *American Anthropologist,* vol. 58, no. 6, Dec. 1956, pp. 1163-1164.

Art
(101) CAPELL, A.: Kooijman's "De kunst van Nieuw Guinea": a review. *Oceania,* vol. 27, no. 1, Sept. 1956, pp. 67-68.
(102) GUNN, H. D.: Kooijman's "De kunst van Nieuw Guinea": a review. *American Anthropologist,* vol. 58, no. 4, Aug. 1956, pp. 767-768.

Education
(103) ———. Education in New Guinea. *A.B.M. Review,* vol. 44, no. 10, Nov. 1956, pp. 166-171.
(104) VELLACOTT-JONES, K.: The building of Talidig School. *Community Development Bulletin,* vol. 7, no. 3, June 1956, pp. 62-65.

General
(105) ———. Barrett's "Wild Life of Australia and New Guinea": a review. *The Geographical Journal,* vol. 122, part 3, Sept. 1956, pp. 386-387.
(106) ———. They called it Shangri-La. *Pacific Islands Monthly,* vol. 27, no. 4, Nov. 1956, pp. 84-86.
(107) IREDALE, Tom: Birds of New Guinea. Melbourne, Georgian House, 1957.*
(108) PUNSHON, W. G.: Arrows into ploughshares. *The Etruscan,* vol. 6, no. 2, Sept. 1956, pp. 39-40.
(109) SIDNEY, John: Progress in Papua, New Guinea. *New Commonwealth,* vol. 32, no. 6, Sept. 17, 1956, p. 264.

Government and Administration
(110) TOWNSEND, G. W. L.: U.N. praise for New Guinea's "men in the field". *Pacific Islands Monthly,* vol. 27, no. 4, Nov. 1956, pp. 69-72.

Health
(111) McPHERSON, —.: Environmental problems in tropical Australia. *South Pacific,* vol. 9, no. 3, Jan.-Feb. 1957, pp. 365-378.

Land Tenure
(112) HOGBIN, Ian: Lawrence's "Land tenure among the Garia": a review. *Oceania,* vol. 27, no. 1, Sept. 1956, pp. 65.

Linguistics
(113) ———. The language problem in Papua and New Guinea. *Oversea Education,* vol. 28, no. 3, Oct. 1956, pp. 138-139.
(114) HALL, Robert A. Jr.: On Melanesian Pidgin in education: letter to editor. *American Anthropologist,* vol. 58, no. 5, Oct. 1956, p. 917.
(115) LUZBETAK, Louis J.: Middle Wahgi phonology. Sydney, *Oceania,* Linguistic Monographs, no. 2, 1956, p. 50 (approx.).*
(116) SALISBURY, Richard F.: The Siane language of the Eastern Highlands of New Guinea. *Anthropos,* vol. 51, 3-4, 1956. pp. 447-480.

Missions
(117) LAWRENCE, Peter: Lutheran mission influence on Madang Societies. *Oceania,* vol. 27, no. 2, Dec. 1956, pp. 73-89.

TONGA

General
(118) ———. Ledyard's "Friendly Island": a review. *Pacific Islands Monthly,* vol. 27, no. 3, Oct. 1956, p. 95.
(119) BAIN, K. R.: The Tongan way. *Corona,* vol. 9, no. 3, Mar. 1957, pp. 88-91.

TRUST TERRITORY OF THE PACIFIC ISLANDS

Anthropology
(120) ———. Barnett's "Anthropology in administration": a review. *The Colonial Review,* vol. 10, no. 1, March 1957, p. 21.

Education
(121) GIBSON, Robert E., and HILL, Margaret E.: A summer teacher program at Ponape. *Oversea Education,* vol. 28, no. 2, July 1956, pp. 64-67.

South Pacific Commission Technical Papers

Copies of Technical Papers, which are published both in English and French editions, may be procured from the South Pacific Commission, Nouméa, New Caledonia, or G.P.O. Box 5254, Sydney, Australia. Except where otherwise stated, price per copy, post free by surface mail, is 2/- stg. (2/6 Aust., 2/3 Fijian, 30 cents U.S., 1 guilder)*.

NUTRITION

18. **Report on Nutrition Investigations by the South Pacific Commission in 1950.** November 1951.
22. **Chemical Composition of the Milk of New Hebridean Mothers.** F. E. Peters, biochemist, South Pacific Commission. February 1952.
23. **Nutrition Research Conducted in New Hebrides during 1951.** Sheila Malcolm, nutritionist, South Pacific Commission. April 1952.
50. **Nutrition Investigation in New Caledonia.** Sheila Malcolm. October 1953.
58. **Bibliography of the Nutritional Aspects of the Coconut.** F. E. Peters. April 1954.
59. **Dietary and Nutritional Problems in the Pacific.** Dr. E. Massal. April 1954.
63. **Diet and Nutrition in American Samoa.** Sheila Malcolm. August 1954.
83. **Diet and Nutrition in the Trust Territory of the Pacific Islands.** Sheila Malcolm. July 1955.
85. **Etudes sur la Nutrition et l'Alimentation dans les Etablissements Francais de l'Oceanie** (Summary and Conclusion in English). Sheila Malcolm. April 1955.
95. **Bibliography of the Nutritional Aspects of the Coconut** (revised edition of T.P. 58). F. E. Peters. September 1956.
100. **Chemical Composition of South Pacific Foods**—An Annotated Bibliography. F. E. Peters. January 1957. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
106. **Some Food Problems In The Pacific Islands.** H. S. McKee. May 1957.

PUBLIC HEALTH

12. **Tuberculosis Investigations by the South Pacific Commission in 1950.** May 1951.
24. **A Survey of Leprosy on the Island of Nauru.** Dr. C. J. Austin, Director, Makogai Leprosy Hospital, Fiji. April 1952.
27. **A Survey of Leprosy in the British Solomon Islands Protectorate.** Dr. C. J. Austin. July 1952.
56. **Leprosy in Netherlands New Guinea.** Dr. Norman R. Sloan. April 1954.
57. **Leprosy in the Trust Territory of the Pacific Islands.** Dr. Norman R. Sloan. April 1954.
62. **Leprosy in American Samoa.** Dr. Norman R. Sloan. July 1954.
64. **Dental Conditions in School Children of American Samoa.** Dr. Raymond G. Neubarth. August 1954.
67. **Ophthalmological Survey of the Trust Territory.** Dr. H. E. Crawford. September 1954.
69. **Leprosy in Western Samoa and the Cook Islands.** Dr. Norman R. Sloan. October, 1954.
96. **Health Education In The South Pacific.** G. Loison and L. L. Keyes. September 1956.

MOSQUITO-BORNE DISEASES

17. **Conference of Experts on Filariasis and Elephantiasis, Tahiti: Summary of Proceedings.** September 1951.
33. **A Survey of Malaria in the British Solomon Islands Protectorate.** Dr. R. H. Black, School of Public Health and Tropical Medicine, University of Sydney. November 1952.
60. **Some Aspects of Malaria in the New Hebrides.** Dr. R. H. Black. May 1954.
61. **Malaria in the Trobriand Islands.** Dr. R. H. Black. May 1954.
65. **Annotated Bibliography of Filariasis and Elephantiasis.** September 1954. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
66. **Distribution of Filariasis in the South Pacific Region.** Dr. M. O. T. Iyengar. September 1954. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
68. **Malaria in the Torres Straits Islands.** M. Josephine Mackerras and Dorothea F. Sandars. October 1954.
80. **Malaria Control and Research in Netherlands New Guinea.** Dr. R. H. Black. March 1955.
81. **Malaria in the South-West Pacific.** Dr. R. H. Black. March 1955.
86. **Distribution of Mosquitoes in the South Pacific Region.** Dr. M. O. T. Iyengar. 1955. (8/- stg., 10/-A., 9/-F., $1.20, 4G.)
88. **Annotated Bibliography of Filariasis and Elephantiasis. Part 2.** Dr. M. O. T. Iyengar. January 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
104. **Developmental Stages Of Filariae In Mosquitoes.** Dr. M. O. T. Iyengar. May 1957.
105. **An Investigation Of Filariasis In The Berau Region.** H. de Rook. May 1957.

TROPICAL CROPS

19. **Report on Copra Grading.** November 1951.
21. **Note on the Mycoflora of Rice Seed in the Territories of the South Pacific.** Dr. F. Bugnicourt, Director, Institut Francais d'Oceanie. January 1952.
31. **Cocoa Plantation Management in Western Samoa.** D. R. A. Eden, General Manager, New Zealand Reparation Estates, and W. L. Edwards, Assistant General Manager. October 1952.
36. **Cocoa Growing in Fiji Islands.** D. H. Urquhart, former Director of Agriculture, Gold Coast. December 1952.
37. **Cocoa Growing in Netherlands New Guinea.** D. H. Urquhart. January 1953.
38. **Coffee Growing in New Caledonia.** D. H. Urquhart. January 1953.
39. **Cocoa Growing in Western Samoa.** D. H. Urquhart. January 1953.
40. **Cocoa Growing in New Hebrides.** D. H. Urquhart. January 1953.
48. **The Management of Coconut Plantations in Western Samoa.** D. R. A. Eden. September 1953.
55. **Grading of Fresh Fruit Exports from South Pacific Territories.** April 1954.
82. **The Manufacture of Copra in the Pacific Islands.** W. V. D. Pieris. July 1955. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
87. **L'agriculture vivriere autochtone de la Nouvelle-Caledonie,** par Jacques Barrau; precedee de l'organisation sociale et coutumiere de la population autochtone, par Jean Guiart. Janvier 1956. Available in French only. (20/- stg., 25/-A., 22/6F., $3.00, 10G.)
94. **Food Plants of the South Sea Islands.** Dr. E. Massal and Jacques Barrau. September 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
97. **Rice Production In The South Pacific Region.** R. Watson. October 1956.

PESTS AND DISEASES OF PLANTS AND ANIMALS

8. **Insect Pests in the Wallis Islands and Futuna.** From report by F. Cohic, Entomologist, Institut Francais d'Oceanie. December 1950.
9. **Report of Plant and Animal Quarantine Conference, Suva.** April 1951.
34. **Rhinoceros Beetle Control in the Kingdom of Tonga.** L. J. Dumbleton, Plant and Animal Quarantine Officer, South Pacific Commission. November 1952.
77. **A List of Diseases and Parasites of Animals Recorded in the South Pacific Territories.** Bilingual. December 1954.
78. **A List of Plant Diseases Recorded in South Pacific Territories.** Bilingual. December 1954.
79. **A List of Insect Pests Recorded in South Pacific Territories.** Bilingual. August 1955. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
101. **Parasites And Predators Introduced Into The Pacific Islands For The Biological Control Of Insects And Other Pests.** C. P. Hoyt. March 1957.
107. **The Rhinoceros Beetle In Western Samoa.** R. A. Cumber. June 1957. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)

ECONOMIC CONDITIONS

54. **The Pacific Islander and Modern Commerce.** V. D. Stace, Assistant Economist, Reserve Bank of New Zealand. March 1954.
89. **Small-Scale Industry for the South Pacific—Preliminary Papers.** Cyril S. Belshaw. March 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)
90. **Industrial Activity in Selected Areas of the South Pacific.** K. H. Danks. March 1956. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
91. **Western Samoa—An Economic Survey.** V. D. Stace. June 1956. (6/- stg., 7/6A., 6/9F., $0.90, 3G.)
92. **Economic Aspects of the Coconut Industry in the South Pacific.** E. J. E. Lefort. September 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)

CURRENT RESEARCH

5. **Fisheries and Animal Health Research Projects of Significance for the South Pacific Region,** conducted under the authority of the C.S.I.R.O., Australia. May 1950.
20. **Research Workers in the South Pacific (now T.P. No. 52).** December 1951.
29. **Current Research in the South Pacific in the Field of Economic Development.** July 1952.
43. **Research in Queensland in Tropical Plant and Animal Industries.** Jacques Barrau, Technical Officer, South Pacific Commission. May 1953.

* Abbreviations used in the above list for the currencies quoted are: stg. (sterling); A (Australian); F (Fijian); $ (United States dollars); G (guilders).

52. **Social Science Research in the Pacific Islands.** December 1953. (Revised edition of Technical Paper No. 20.)
98. **Social Science Research In The Pacific Islands.** November 1956. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)
102. **Index Of Social Science Research Theses On The South Pacific.** April 1957. (4/- stg., 5/-A., 4/6F., $0.60, 2G.)

CO-OPERATIVES

1. **The Co-operative Movement in the Gilbert and Ellice Islands.** H. E. Maude. February 1949.
10. **Bibliography of Co-operation in the South Pacific** (Now T.P. No. 51). April 1951.
42. **The Co-operative Movement in Papua and New Guinea.** Prepared by the Registry of Co-operative Societies, Port Moresby. February 1953.
51. **A Bibliography of Co-operation in the South Pacific.** December 1953. (Revised Edition of Technical Paper No. 10.)
75. **Catalogue of the Commission's Co-operative Library** (Bibliography of Co-operation). January 1955. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)

COMMUNITY DEVELOPMENT

2. **Community Development.** March 1950.
11. **Interim Reports on the Moturiki (Fiji) Community Development Project.** Howard Hayden, Director of Education, Fiji. May 1951.
26. **Further Education in the Cook Islands.** P. F. Henderson, Officer for Further Education, Cook Islands. July 1952.
35. **The Purari Delta—Background and Progress of Community Development.** November 1952.
45. **The Nimboran Community Development Project.** Dr. J. van Baal, Director of the Bureau of Native Affairs, Netherlands New Guinea. June 1953.
46. **The Koror Community Centre.** Reports supplied by the High Commissioner, Trust Territory of the Pacific Islands. August 1953.
74. **Educational Aspects of Community Development.** R. Thomson. January 1955. (4/- stg., 5/- A., 4/6F., $0.60, 2G.)
84. **The Communities Project Approach to Economic Development.** H. Belshaw. July 1955.

EDUCATION

3. **The Village Library.** April 1950.
4. **Visual Aids in Education in the South Pacific.** A. L. Moore, Visual Aids Consultant. April 1950.
13. **Vocational Training Facilities in Australia for Students from South Pacific Territories.** May 1951. (Out of print.)
14. **Educational Broadcasts to Samoan Village Schools.** Department of Education, Western Samoa. May 1951.
15. **Libraries for Beginners.** Dr. and Mrs. Kenneth Todd, Kwato Mission, Eastern Papua. July 1951.
32. **Types of Organization in Adult and Mass Literacy Work.** D. B. Roberts, Organizer of Island Literature, South Pacific Commission. August 1952.
44. **The Use of the Vernacular in Teaching in the South Pacific.** G. J. Platten. June 1953.
47. **Central Vocational Training Institution.** F. J. Harlow. August 1953. 5/- stg.; plans available sep., 5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
72. **Literacy Teaching for Adults.** Karel Neijs. November 1954. (5/- stg.)
73. **Educational Evaluation—A Documentary Survey.** J. C. Nield. December 1954.
99. **Education In The Pacific Islands—A Selective Bibliography.** C. Wedgwood. November 1956.

OTHER SUBJECTS

6. **A Preliminary List of Economic Plants of New Caledonia.** J. Barrau, Director of Agriculture, New Caledonia. July 1950.
7. **A Preliminary List of Plants Introduced into Tahiti.** July 1950.
16. **Some Notes and Suggestions Regarding Conservation of Important Archaeological Sites and Archives in South Pacific Territories.** F. M. Keesing. August 1951. (5/- stg., 6/3A., 5/6F., $0.75, 2.50G.)
25. **Report of Fisheries Conference, Noumea.** May 1952.
28. **Coral as a Building Material.** July 1952.
30. **Bibliography of Cargo Cults and other Nativistic Movements in the South Pacific.** Ida Leeson. July 1952.
41. **Social Problems of Non-Maori Polynesians in New Zealand.** Rev. R. L. Challis, Pastor of the Pacific Islanders' Congregational Church in New Zealand. February 1953.
49. **The Social and Cultural Position of Micronesian Minorities on Guam.** R. R. Solenberger. October 1953.
53. **Reclamation of Tidal Mud Flats in Tonga.** W. Straatmans, Head of the Department of Agriculture, Nuku'alofa, Tonga. March 1954.
70. **A Linguistic Survey of the South-Western Pacific.** Dr. A. Capell. November 1954. (20/- stg., 25/-A., 22/6F., $3.00, 10G.)
71. **Film and Filmstrip Catalogue.** September 1954. (3/- stg., 3/9A., 3/6F., $0.45, 1.50G.)
76. **A Bibliography of Tropical Housing.** January 1955.
93. **Clearing House Service for Broadcast Recordings—Information and Catalogue.** July 1956.
103. **How to Make Your Own Posters.** Nancy Phelan. May 1957. (2/6 stg., 3/3A., 2/9F., $0.40, 1.25G.)
108. **Practical Aspects Of Weed-Killing By Chemicals In Tropical Crops.** E. J. E. Lefort. July 1957.

PRINCIPAL COMMISSION PUBLICATIONS

- *SPC QUARTERLY BULLETIN:*
  Annual Subscription ..... *8/-Stg.*
- *TECHNICAL PAPERS:* These are technical reports on a wide range of subjects in the economic, social and health fields (list on back cover).
- *OFFICIAL RECORDS: Proceedings of Sessions of the South Pacific Commission* (First to Sixteenth); *Annual Reports of the South Pacific Commission* (1948 *to* 1956); *Reports on the First and Second South Pacific Conferences; Progress Reports on Action Taken on the Resolutions of the First and Second South Pacific Conferences.*
- *EXPERT REPORTS:* The Oxford University Press is publishing a series of Expert Reports in book form for the Commission. Four have been issued to date:

  VOCATIONAL TRAINING IN THE SOUTH PACIFIC. By R. A. Derrick, M.B.E., A.M.I.S.E., F.R.G.S. Mr. Derrick's report consists of a survey of the facilities for professional and technical training in the whole of the South Pacific, and of recommendations for future development.
  Price in Australia ..... *30/-A.*

  MOTURIKI: A PILOT PROJECT IN COMMUNITY DEVELOPMENT. By Howard Hayden. A fully documented, copiously illustrated report on a pilot project in community development carried out under Commission sponsorship on the island of Moturiki by the Government of Fiji.
  Price in Australia ..... *42/-A.*

  SOCIAL ANTHROPOLOGY IN MELANESIA: A Review of Research by Dr. A. P. Elkin, Professor of Anthropology in the University of Sydney. In this report Dr. Elkin reviews past, present and future anthropological research in Melanesia, designed to advance native welfare.
  Price in Australia ..... *27/6A.*

  SOCIAL ANTHROPOLOGY IN POLYNESIA: A Review of Research by Dr. Felix M. Keesing, Professor of Anthropology, Stanford University. This is a parallel study to Professor Elkin's report on anthropological research in Melanesia.
  Price in Australia ..... *27/6A.*
- *BIBLIOGRAPHY:* The following bibliography has been published for the Commission by Oxford University Press:

  A BIBLIOGRAPHY OF BIBLIOGRAPHIES OF THE SOUTH PACIFIC: Compiled by Miss Ida Leeson, former Mitchell Librarian. A basic catalogue arranged by area and subject.
  Price in Australia ..... *15/-A.*
- *OTHER PUBLICATIONS:*

  The Construction of Literacy Primers for Adults: By Dr. K. Neijs ..... *5/-Stg.*
  How to Make Your Own Filmstrips: By Nancy Phelan. *2/6Stg.*

The above volumes are obtainable through leading booksellers.

INQUIRIES REGARDING COMMISSION PUBLICATIONS MAY BE DIRECTED TO THE SECRETARY-GENERAL, SOUTH PACIFIC COMMISSION, NOUMEA, NEW CALEDONIA, OR TO G.P.O. BOX 5254, SYDNEY, AUSTRALIA.

Printed by Bridge Printery Pty. Ltd., 117 Reservoir St., Sydney.

Malaria. . . . an effective treatment

The outstanding advantage of CAMOQUIN is the ease with which the control of malaria can be achieved. A single dose can usually be relied upon to produce an effective clinical cure, while one dose every week gives a high degree of protection.

CAMOQUIN has met with considerable success in all forms of malaria in Africa, India, the Philippines and South America and has been suggested as the product of choice*.

Supplied in bottles of 25, 100 and 1000.

A specially flavoured infant tablet is also available in bottles of 25 and 100.

PARKE-DAVIS **CAMOQUIN**

* *"The superiority of 'Camoquin' over other antimalarials", Singh, I. & Kalyanum, T. S.* Brit. Med. Jnl. 1952: 2: 312

PARKE, DAVIS & COMPANY, LIMITED *(Inc. U.S.A.)* SYDNEY, N.S.W.

BURNS, PHILP & COMPANY LIMITED

HEAD OFFICE:

7 BRIDGE STREET, SYDNEY, N.S.W.

Established 1883 Paid-up Capital, £4,000,000

BRANCHES THROUGHOUT AUSTRALIA, NEW ZEALAND AND AT LONDON

SHIP OWNERS AND SHIPPING AGENTS, MERCHANTS—WHOLESALE AND RETAIL—GENERAL AGENTS AND PLANTATION OWNERS

Represented in the Pacific Islands by:

- **BURNS PHILP (SOUTH SEA) COMPANY LTD.**
- **BURNS PHILP (NEW HEBRIDES) LIMITED**
- **BURNS PHILP (NEW GUINEA) LIMITED**

and in the United States of America by:

BURNS PHILP COMPANY OF SAN FRANCISCO

510-515 Matson Building
San Francisco

We are thoroughly equipped and experienced to cater for your every want, whether it be goods of any description, Shipping, Insurance, Agency, Travel, etc.

BURNS PHILP TRUST COMPANY LIMITED

Head Office:

7 BRIDGE STREET, SYDNEY, N.S.W.

Specialise as Managing Attorneys, Trustees and Executors for Estates throughout Australia and the Pacific Islands